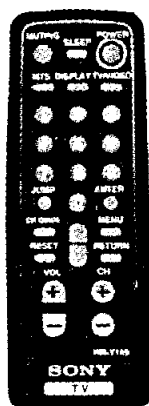


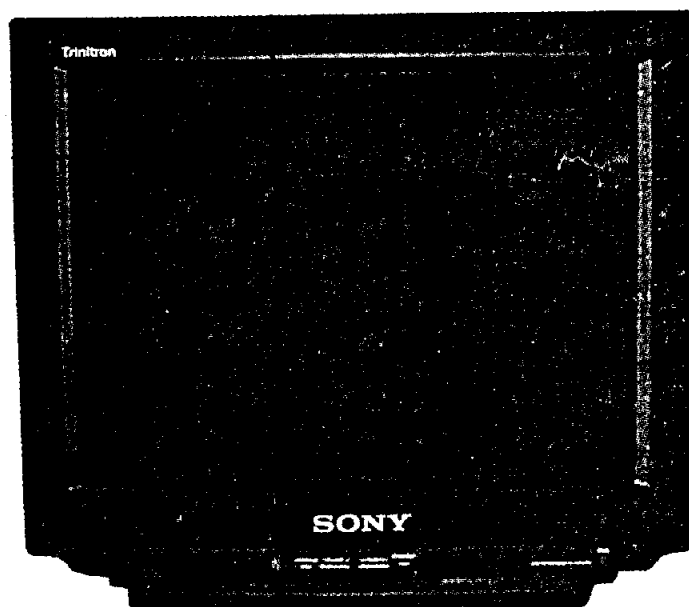
SERVICE MANUAL

BA-3 CHASSIS

<u>MODEL</u>	<u>COMMANDER</u>	<u>DEST.</u>	<u>CHASSIS NO.</u>
KV-21PM2	RM-Y146	MX	SCC-J95G-A
KV-21PS2	RM-Y145	MX	SCC-J95H-A
KV-21R22	RM-Y146	E	SCC-J94Q-A
KV-21R22C	RM-Y146	E	SCC-J94M-A
KV-21RD2	RM-Y146	E	SCC-J94R-A
KV-21RS22C	RM-Y145	E	SCC-J94L-A
KV-21RS50	RM-Y145	E	SCC-J94P-A
KV-21RS50C	RM-Y145	E	SCC-J94N-A
KV-21SD2	RM-Y145	E	SCC-J94S-A



RM-Y145



KV-21RS50



996582801

TRINITRON® COLOR TV
SONY®

SPECIFICATIONS

■ FOR ALL MODELS (except as noted)

Television system	American TV standard
Channel coverage	VHF: 2-13 UHF: 14-69 CATV: 1-125
Antenna	75Ω, external antenna terminal for VHF /UHF
Picture tube	Trinitron® tube 21-inch tube measured diagonally
Power requirements	120V, 60 Hz 220V, 50/60 Hz (KV-21R22C/ 21RS22C/21RS50C only)
Supplied accessories	Size AA (R6) batteries (2) Remote control RM-Y145 (1) (KV- 21PS2/21RS22C/21RS50/ 21RS50C/21SD2) Remote control RM-Y146 (1) (KV-21PM2/21R22/21R22C/ 21RD2) Antenna dipole (1) Antenna connector (1)

■ KV-21PM2/21R22/21R22C/21RD2

Input	Video (phono jacks): 1Vp-p, 75Ω unbalanced negative sync Audio (phono jacks) 500 mVrms (100% modulation) Impedence: 47Ω A/V input (rear)
Output	Headphone jack
Speaker output	1 speaker 2W (8Ω)
Power consumption	90W when in use 6W in standby 8W in standby (KV-21R22C only)
Dimensions (W/H/D)	522 x 477 x 471.7 mm (20 ^{1/2} x 18 ^{3/4} x 18 ^{1/2} in.)
Mass	21.3 kg (46 lbs, 13 oz)

■ KV-21PS2/21RS22C/21RS50/21RS50C/21SD2

Input	Video (phono jacks): 1Vp-p, 75Ω unbalanced negative sync Audio (phono jacks) 500mVrms (100% modulation) Impedence: 47Ω A/V input (rear)
Output	Headphone jack Audio out (KV-21RS50/21RS50C) More than 800mVrms at max. volume setting (variable) More than 800mVrms (fix) Impedence: 5KΩ
Speaker output	2 speakers (2Wx2) 8Ω (KV-21PS2/ 21RS22C/21SD2 only) 2 speakers (3Wx2) 4Ω (KV-21RS50/21RS50C only)
Power consumption	90W when in use 7W in standby 8W in standby (KV-21RS22C/21RS50C only)
Dimensions (W/H/D)	522 x 477 x 471.7 mm (20 ^{1/2} x 18 ^{3/4} x 18 ^{1/2} in.) (KV-21PS2/21RS22C/21SD2) 550 x 464 x 468.8 mm (21 ^{5/8} x 18 ^{1/4} x 18 ^{1/2} in.) (KV-21RS50/21RS50C only)
Mass	21.4 kg (47 lbs) (KV-21PS2/21RS22C/21SD2) 23.4 kg (51 lbs, 8 oz) (KV-21RS50/21RS50C)

Design and specifications are subject to change without notice.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
1. GENERAL			4. SAFETY RELATED ADJUSTMENT		13
	Connecting the TV	4	5. CIRCUIT ADJUSTMENTS		
	Using the Remote Control	4	5-1. Electrical Adjustment by Remote Commander	15	
	Setting Up Channels	5	5-2. A Board Adjustments	17	
	Watching the TV	5	6. DIAGRAMS		
	Using the Video Menu	6	6-1. Block Diagrams	19	
	Additional Features	6	6-2. Circuit Boards Location	22	
	Selecting Stereo or Bilingual Program(MTS)	6	6-3. Printed Wiring Boards and Schematic Diagrams	22	
	Turning on Surround Sound	7	• A Board	23	
	Adjusting Treble, Bass and Balance	7	• C Board	31	
	Selecting a Caption Vision Option	7	6-4. Semiconductors	32	
	Customizing the Channel Number Buttons	7	7. EXPLODED VIEWS		
2. DISASSEMBLY			7-1. Chassis	33	
2-1. Rear Cover Removal	8		8. ELECTRICAL PARTS LIST		34
2-2. A Board Removal	8				
2-3. Service Position	8				
2-4. Picture Tube Removal	9				
3. SET-UP ADJUSTMENTS					
3-1. Beam Landing	10				
3-2. Convergence	11				
3-3. Focus	12				
3-4. Screen (G2)	12				
3-5. Method of Setting the Service Adjustment Mode	12				
3-6. White Balance Adjustments	12				

CAUTION!

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

ATTENTION!!

AFIN D'EVITER TOUT RESQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK Δ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL FOR SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

LES COMPOSANTS IDENTIFIES PAR UNE TRAME ET PAR UNE MARQUE Δ SUR LES SCHEMAS DE PRINCIPE, LES VUES EXPLOSEES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SECURITE DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMERO DE PIECE EST INDIQUE DANS LE PRESENT MANUEL OU DANS DES SUPPLEMENTS PUBLIES PAR SONY. LES REGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SECURITE DU FONCTIONNEMENT SONT IDENTIFIES DANS LE PRESENT MANUEL. SUIVRE CES PROCEDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT SUSPECTE.

SECTION 1 GENERAL

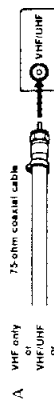
The instructions mentioned in this section are partial abstracts from the Operating Instruction Manual. The pages numbers shown reflect those of the Operating Instruction Manual.

Step 1: Connecting the TV

You can use an indoor antenna, outdoor antenna, or cable system with your TV. Outdoor antennas or cable TV systems usually provide the best picture quality.

Connecting an Indoor, Outdoor or Cable Antenna

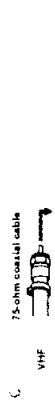
Connect your antenna or cable to the TV's VHF/UHF antenna terminal.



If you cannot connect your antenna or cable directly to the TV antenna terminal, follow one of the diagrams below.

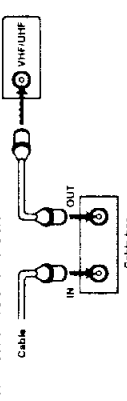


(see Specifications on page 16 for models)



Connecting to a Cable TV System Through a Cable Box

If your cable system requires use of a cable box, make the connection as shown below.



Connecting a VCR

See your VCR instructions to set up the VCR. After connecting the VCR to the TV, you will be able to do the following:

- Watch video tapes

- Record one TV program while viewing another

Check the model number of your TV and select the appropriate connection diagram.

Notes

- If your cable system requires use of a Cable Box, install it between the antenna cable and the VCR.
- For a monaural VCR, connect the audio output of the VCR to the AUDIO L (MONO) VIDEO.
- Connect your S-Video cable (KV-20V60 only) to the S-VIDEO input on the TV. S-Video will override your standard video input, providing the most stable picture. S-Video does not provide audio output.

Step 2: Using the Remote Control

Instructions in this manual are based on using the remote control. You can also use the controls on the TV.

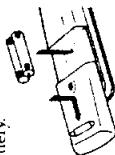
The menu illustrations are from KV-20M20. When features found on other models are discussed, the manual lists the models covered by that specific set of menus.

Note

- The menu disappears 90 seconds after you press a button, or immediately after you press MENU.
- Refer to separate instructions for remote control pre-programming (KV-20V60 only).

Inserting Batteries

Insert two size AA (R6) batteries (supplied) by matching the + and - on the batteries to the + and - inside the battery compartment. With normal use, the batteries should last for approximately six months. Model shown is RM-Y145, Y146. RM-Y117 uses one battery.



Notes

- Remove the batteries to avoid possible damage from battery leakage if you will not be using the remote control for an extended period of time.
- Handle the remote control with care. Avoid dropping it, getting it wet, or placing it in direct sunlight, near a heater, or where the humidity is high.

Changing the Menu Language

Except Canadian models

If you want to view the menus in Spanish, you can change the menu language.

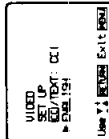
- 1 Press MENU.

The Main menu appears.



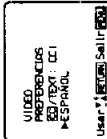
- 2 Press \blacktriangle or \blacktriangledown to move the cursor (\blacktriangleright) to ENGLISH and press RETURN.

ENGLISH will turn red.



- 3 Press \blacktriangle or \blacktriangledown to select ESPAÑOL and press RETURN.

ESPAÑOL will turn green.



- 4 Press MENU to return to the TV program.

Note

- Some parts of the Spanish menus will appear in English.

Watching the TV

Press **POWER** to turn the TV on.

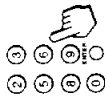
Note

- If VIDEO is on the screen, press TV/VIDEO so that a channel number appears.

Selecting a Channel Directly

Press 0-9 to select a channel.

The channel will change after 2 seconds, or you can press **ENTER** for immediate selection.



Scanning Through Channels

Press **CH +/-** until the channel appears.

CH

Jumping Quickly Between Two Channels

Press **JUMP**.

The TV switches from the current channel to the previous channel that you watched.

Pressing **JUMP** again switches back to the first channel.

Note

- You can only jump to channels you have selected with the **CH** keys, or back to the last channel you scanned.

Adjusting the Volume

Press **VOL +/-** to adjust the volume.

VOL

Muting the Sound

Press **MUTING**.

MUTING appears on the screen.

To restore the sound, press **MUTING** again, or press **VOL +/-**.

Displaying On-Screen Information

Use the **DISPLAY** key to check the TV's Display settings.

1 Press **DISPLAY**.

The channel number will be displayed. The TV will also display the MT5 mode if CAT MAIN or MONO are selected (KV-20S20, 20S21, 20S30, 20V60, 21PS2, 21RS22C, 21RS50, 21RS50C, 21SD2 only).

The MTS mode display disappears after 4 seconds.

2 Press **DISPLAY** again.

XDS (ON) will appear on the screen. If XDS (Extended Data Service) is broadcasting, information will then appear on the screen (except KV13M20, 14PM1, 14R20, 14R20C, 14RD1).

3 Press **DISPLAY** again.

CCI (ON) (if selected) will appear on the screen for a few seconds. Captions will then appear at the top or bottom of the screen.

4 To turn off Caption Vision or XDS display, press **DISPLAY** again until **DISPLAY OFF** appears.

Note

- See page 13 for more information about Caption Vision.

Setting up Your Channels • Setting Cable TV On or Off • Auto Programming • Erasing or Adding Channels

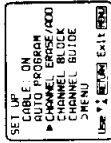
Erasing or Adding Channels

After you run **AUTO PROGRAM**, you can erase unnecessary channels or add new ones.

1 Press **MENU**.

2 Press **UP** or **DOWN** to select **SET UP** and press **RETURN**.

3 Press **UP** or **DOWN** to select **CHANNEL ERASE/ADD** and press **RETURN**.



Operating Instructions

4 To erase or add a channel:

(1) Press **CH +/-** or (0-9) to select the channel you want to erase or add.

(2) Press **UP** or **DOWN** to select **ERASE** (or **ADD**).

(3) Press **RETURN**.

If you are erasing a channel, the "—" symbol appears next to the channel number. If you are adding a channel, the "+" symbol appears next to the channel number.

5 To erase or add other channels, repeat step 4.

6 Press **MENU** to return to the TV program.

Note

- If you erase or add a VHF or UHF channel, the cable TV channel with the same number is also erased or added.

Step 3: Setting up Your Channels

Setting Cable TV On or Off

If you have connected the TV to a cable TV system, set **CABLE** to **ON**. If not, set **CABLE** to **OFF**.

1 Press **MENU**.

2 Move the cursor to **SET UP** and press **RETURN**.

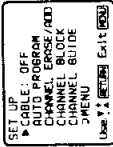
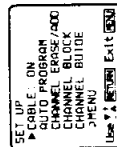
3 Move the cursor to **CABLE** and press **RETURN**.

ON

4 Press **UP** or **DOWN** to select **ON** or **OFF**.

5 Press **RETURN**.

6 Press **MENU** to return to the TV program.



Note
If the screen is black, the TV is set to a video input and you cannot select **CABLE**. Press TV/VIDEO until a channel number appears, then follow steps 1-6.

Auto Programming Your Channels

TV channels can be preset easily. First, you can store all the receivable channels automatically. Later, you can erase unwanted channels or add additional channels.

Notes

- If the TV is set to VIDEO, you cannot run **AUTO PROGRAM**. Press TV/VIDEO on the remote control until a channel number appears.
- It is usually best to preset channels during the day when more channels are broadcasting.

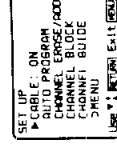
1 Press **MENU**.

The Main menu appears.



2 Press **UP** or **DOWN** on the remote control to move the cursor (→) to **SET UP**. Press **RETURN**.

On the **SET UP** menu appears.



3 Press **UP** or **DOWN** to move the cursor to **AUTO PROGRAM** and press **RETURN**.

AUTO PROGRAM appears on the screen and the TV starts scanning and presetting channels. When all of the receivable channels are stored, **AUTO PROGRAM** disappears.

Note

- AUTO PROGRAM** may tune in some channels which appear fuzzy on your screen. You can erase these channels using **CHANNEL ERASE/ADD**.
- Pressing any button on the remote control while **AUTO PROGRAM** is scanning and presetting channels will cause **AUTO PROGRAM** to stop.

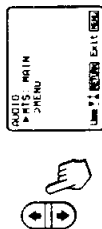
Additional Features

Selecting Stereo or Bilingual Programs (MTS)

KV-20520, 20521, 20530, 20V60, 21PS2, 21RS22C, 21RS50, 21RS50C, 21SD2 only. Menus shown are for KV-20520.

The Multichannel TV Sound (MTS) feature allows you to enjoy stereo sound (MAIN), Second Audio Programs (SAP), or monaural sound (MONO) when available.

- 1 Press MENU.
- 2 Move the cursor to AUDIO and press RETURN.
- 3 Move the cursor to MTS and press RETURN.
- 4 Press \blacktriangle or \blacktriangledown to select MAIN, SAP, or MONO.
- 5 Press MENU to return to the TV program.



Choose	To
MAIN	Listen to stereo sound.
SAP	Listen to bilingual and other programs.
MONO	Reduce noise during poor stereo broadcasts.

For Direct MTS Access

KV-20520, 20530, 20V60, 21PS2, 21RS22C, 21RS50, 21RS50C, 21SD2 only. You can access MTS directly through the MTS button on your remote control.

- 1 Press MTS.
- Pressing MTS repeatedly will cycle the TV through the MTS options as follows:

MAIN \rightarrow SAP \rightarrow MONO \rightarrow MAIN

Note

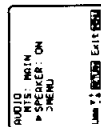
- The sound of non-SAP programs may be muted when SAP is selected.

Setting the Speaker Switch (SPEAKER)

KV-20520, 20V60, 21RS50, 21RS50C only.

You can listen to the TV sound through your TV and a separate stereo system, or switch off the TV speakers to listen to TV sound only through the stereo.

- 1 Press MENU.
- 2 Move the cursor to AUDIO and press RETURN.
- 3 Move the cursor to SPEAKER and press RETURN.
- 4 Press \blacktriangle or \blacktriangledown to select ON or OFF.
If you select OFF, VARIABLE and FIXED will appear. See step 5 of "Changing Audio Out Speaker Volume".
- 5 Press MENU to return to the TV program.



Changing Audio Out Speaker Volume

KV-20520, 20V60, 21RS50, 21RS50C only. You can control the volume of the TV program when you play the TV sound through a separate stereo system.

- 1 Press MENU.
- 2 Move the cursor to AUDIO and press RETURN.
- 3 Move the cursor to SPEAKER and press RETURN.
- 4 Press \blacktriangle or \blacktriangledown to set SPEAKER to OFF and press RETURN.

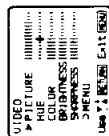
Using the VIDEO Menu • Adjusting the Video Settings

Using the VIDEO Menu

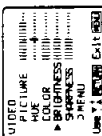
Adjusting the Video Settings

You can adjust the picture, hue, color, brightness, and sharpness of any TV image.

- 1 Press MENU.
- 2 Move the cursor (\blacktriangle) to VIDEO and press RETURN.



- 3 Press \blacktriangle or \blacktriangledown to select the feature you want to adjust and press RETURN.
See the Adjustable Items chart for a list of the adjustments you can make.



- 4 Press \blacktriangle or \blacktriangledown to adjust the setting of the selected feature and press RETURN.
The new setting appears in the VIDEO menu.



- 5 To adjust other video settings, repeat steps 3 and 4.
- 6 Press MENU to return to the TV program.

ADJUSTABLE ITEMS

Item	Press \blacktriangle to	Press \blacktriangledown to
PICTURE	Increase the contrast	Decrease the contrast
HUE	Increase the green tones	Decrease the green tones
COLOR	Increase color intensity	Decrease color intensity
BRIGHTNESS	Brighten the picture	Darken the picture
SHARPNESS	Sharpen the picture	Soften the picture

Restoring the factory video settings

- 1 To restore the factory video settings, press RESET while the VIDEO menu is displayed.

Watching the TV • Selecting a Channel • Scanning • Jumping • Volume • Muting • On-Screen Information • Watching Video Tapes • Sleep Timer • Clock • Timer

Watching Video Tapes

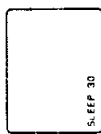
- 1 Press TV/VIDEO until the correct video input appears.

- 2 Press PLAY on your VCR to view the video tape.
- 3 Press TV/VIDEO to return to the TV program.

Setting the Sleep Timer

The SLEEP timer allows the TV to stay on for a length of time and then shut off automatically.

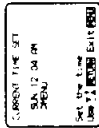
- 1 Press SLEEP until the time you want appears.
Each time you press SLEEP, the display moves between 30, 60, 90, and OFF.
SLEEP appears one minute before the TV shuts off.
To cancel the sleep timer, press SLEEP again until SLEEP OFF appears, or turn off the TV.



Setting the Clock

KV-21PM2, 21PS2, 21R22, 21R22C, 21RD2, 21RS22C, 21RS50, 21RS50C, 21SD2 only.

- 1 Select TIMER from the MENU.
- 2 Select CURRENT TIME SET from the TIMER menu and press RETURN.
- 3 Set the current day.
Press RETURN until the day entry is highlighted.



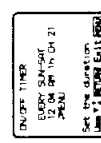
- 4 Set the current time.
Press RETURN until the time entry is highlighted.
Press \blacktriangle or \blacktriangledown until the current hour is displayed and press RETURN.
Press \blacktriangle or \blacktriangledown until the current minute is displayed and press RETURN.
- 5 Press MENU to return to the original screen.

Setting the Timer

KV-21PM2, 21PS2, 21R22, 21R22C, 21RD2, 21RS22C, 21RS50, 21RS50C, 21SD2 only.

Setting the TIMER allows the TV to turn on and off at specified times. The CLOCK must be set in order for the TIMER to function. See "Setting the Clock."

- 1 Select TIMER from the MENU.
- 2 Select ON/OFF TIMER from the TIMER menu and press RETURN.
- 3 Enter the ON/OFF TIMER setting.
 - a Press RETURN until the day entry is highlighted.
Press \blacktriangle or \blacktriangledown to cycle through the day options as follows:
EVERY SUN, SAT \rightarrow EVERY MON-FRI \rightarrow SUNDAY \rightarrow EVERY SATURDAY \rightarrow EVERY SUNDAY \rightarrow EVERY SATURDAY
Select an entry and press RETURN. (Press \blacktriangle to cycle in reverse.)
 - b Press RETURN until the time entry is highlighted.
Press \blacktriangle or \blacktriangledown to set the hour and press RETURN.
 - c Press \blacktriangle or \blacktriangledown to set the duration, up to six hours, and press RETURN.
 - d Press \blacktriangle or \blacktriangledown to select the channel and press RETURN.
The timer indicator on the front of the TV will light up.

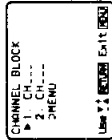


Note

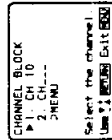
- If you exit the ON/OFF TIMER menu while setting the TIMER, your settings will be saved.
- To erase your ON/OFF TIMER settings, press RESET.

Caption Vision • CHANNEL GUIDE • Listening with Headphones

- 4 Move the cursor to 1 or 2 and press RETURN.



- 5 Press \blacktriangle or \blacktriangledown to select the channel that you want to block. Press RETURN.



- 6 Repeat steps 4 and 5 to enter the second channel that you want to block.

- 7 Press MENU to return to the TV program.

If you switch to the blocked channel, BLOCKED appears. The screen is black and the sound is muted.

To cancel a CHANNEL BLOCK setting

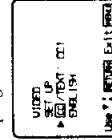
- 1 Follow steps 1–4 above.
- 2 Press RESET.

Selecting a Caption Vision Option

Caption Vision options include CC1, 2, 3, and 4, or TEXT1, 2, 3, and 4. CC1, 2, 3, and 4 show a caption or printed version of the dialog or sound effects of a program. CC1 will be the setting for most programs. TEXT1, 2, 3, and 4 show text information on half of the screen. This text is not usually related to the program.

- 1 Press MENU.

- 2 Press \blacktriangle or \blacktriangledown to select [CC/TEXT/CC1] and press RETURN.



- 3 Press \blacktriangle or \blacktriangledown to select the caption type (CC1, 2, 3, 4, or TEXT1, 2, 3, or 4) and press RETURN.

- 4 Press MENU to return to the TV program.

- 5 To view Caption Vision, press DISPLAY several times until CC1, 2, 3, 4, or TEXT1, 2, 3, 4 ON is displayed, if broadcasting.

The caption will appear in a few seconds.

- 6 To turn off Caption Vision, press DISPLAY until DISPLAY OFF appears.

Notes

- Captions disappear for a few seconds when you press the MUTE button.
- Captions may appear with a white box or other errors if you have poor reception of the channel.

- 5 Move the cursor to FIXED or VARIABLE and press RETURN.
Your selection will turn yellow.
- 6 Press MENU to return to the TV program.

Choose	To
FIXED	Adjust the volume with your stereo.
VARIABLE	Adjust the volume through the TV.

Note
• Set the volume on your stereo low when switching from VARIABLE to FIXED to avoid overloading your external speakers.

Turning on Surround Sound

KV-20V60 only
Use this feature to listen to TV audio in Surround Sound mode.

- 1 Press MENU.
- 2 Move the cursor (\blacktriangle) to AUDIO and press RETURN.
- 3 Move the cursor to SURROUND and press RETURN.
- 4 Press \blacktriangle or \blacktriangledown to set SURROUND ON or OFF.
- 5 Press MENU to return to the TV program.

Adjusting Treble, Bass, and Balance

KV-20V60 only

- 1 Press MENU.
- 2 Move the cursor (\blacktriangle) to AUDIO and press RETURN.
- 3 Move the cursor to TREBLE, BASS, or BALANCE and press RETURN.

Choose	To
TREBLE	Increase or decrease high pitched sounds.
BASS	Increase or decrease low pitched sounds.
BALANCE	Change the balance between speakers.

- 4 Press \blacktriangle or \blacktriangledown to increase or decrease the setting.
- 5 Press RETURN to make other audio adjustments.
- 6 Press MENU to return to the TV program.

Restoring the Factory Audio Settings
1 To restore the factory audio settings, press RESET while the AUDIO menu is displayed.

Blocking Out a Channel (CHANNEL BLOCK)

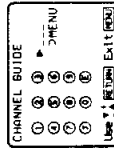
This feature allows you to prevent children from watching selected channels.

- 1 Press MENU.
- 2 Move the cursor to SET UP and press RETURN.
- 3 Move the cursor to CHANNEL BLOCK and press RETURN.

Customizing the Channel Number Buttons (CHANNEL GUIDE)

You can assign up to 12 of your favorite channels to CHANNEL GUIDE locations and switch to them with the CHANNEL GUIDE.

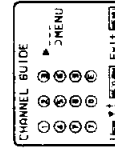
- 1 Press MENU.
- 2 Press \blacktriangle or \blacktriangledown to select SET UP and press RETURN.
- 3 Press \blacktriangle or \blacktriangledown to select CHANNEL GUIDE and press RETURN.
- 4 Press RETURN again to move the cursor to the number pad.



- 5 Press \blacktriangle or \blacktriangledown to select a number on the CHANNEL GUIDE (the button number will turn red) and press RETURN.

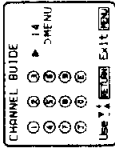
The --- turns red.

Buttons 0–9, JUMP (J), and ENTER (E) are available for CHANNEL GUIDE access.



- 6 Press \blacktriangle or \blacktriangledown to select the channel that you want to assign to that button, and press RETURN.

The TV will switch to that channel.



- 7 Repeat steps 5–7 to set other channels.

- 8 Press MENU to return to the current TV program.

To remove a CHANNEL GUIDE setting

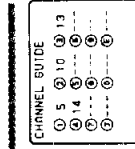
- 1 Repeat steps 1–6 to select the channel that you want to remove.

- 2 Press RESET.

Using the CHANNEL GUIDE

- 1 Press CH GUIDE.

The CHANNEL GUIDE shows button numbers and the channels assigned to them.



- 2 Press 0–9, JUMP or ENTER on the remote control to switch to the channel you want to view.

- 3 To cancel the CHANNEL GUIDE display without selecting a channel, press CH GUIDE again.

Listening with Headphones or an Earphone

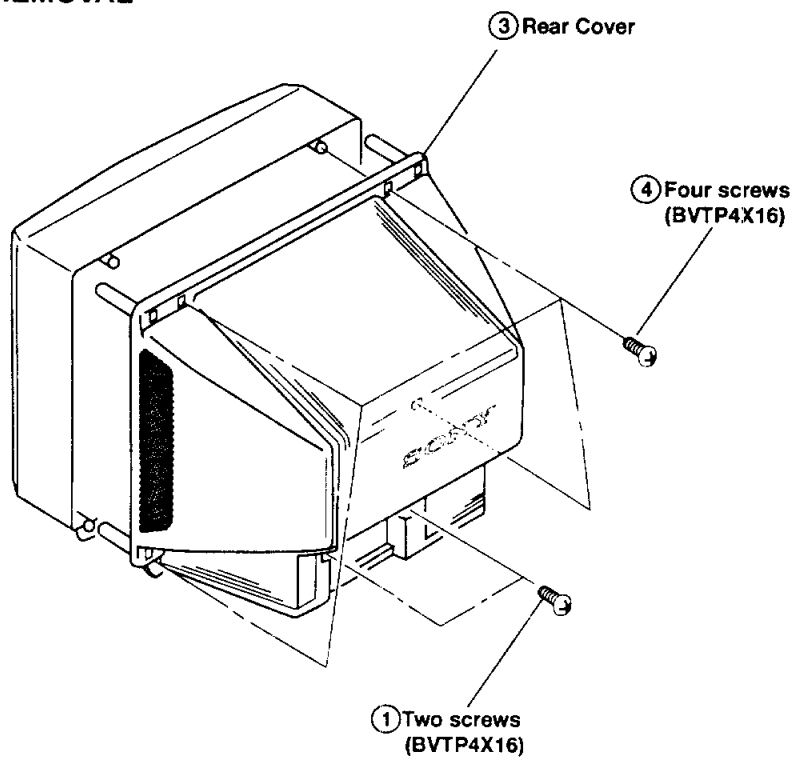
Plug the headphones or earphone into the jack on the front of the TV. Using headphones will turn off the sound to the TV speakers.

Notes

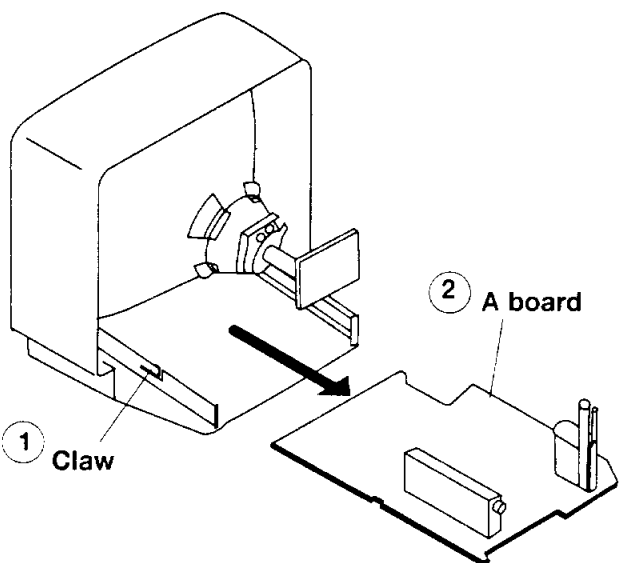
- To prevent hearing damage due to sudden or prolonged excessive volume, do not set the volume too high while listening.
- If your TV is monaural, the monaural sound will be heard from both headphones.

SECTION 2 DISASSEMBLY

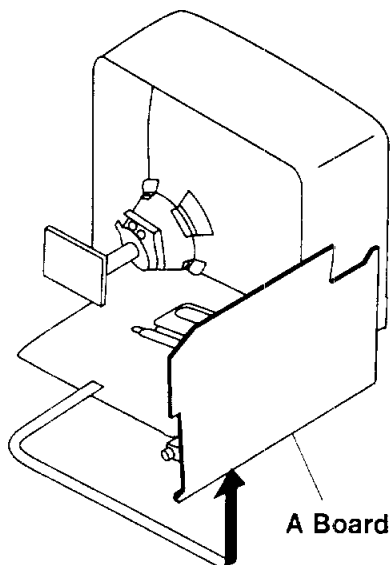
2-1. REAR COVER REMOVAL



2-2. A BOARD REMOVAL



2-3. SERVICE POSITION

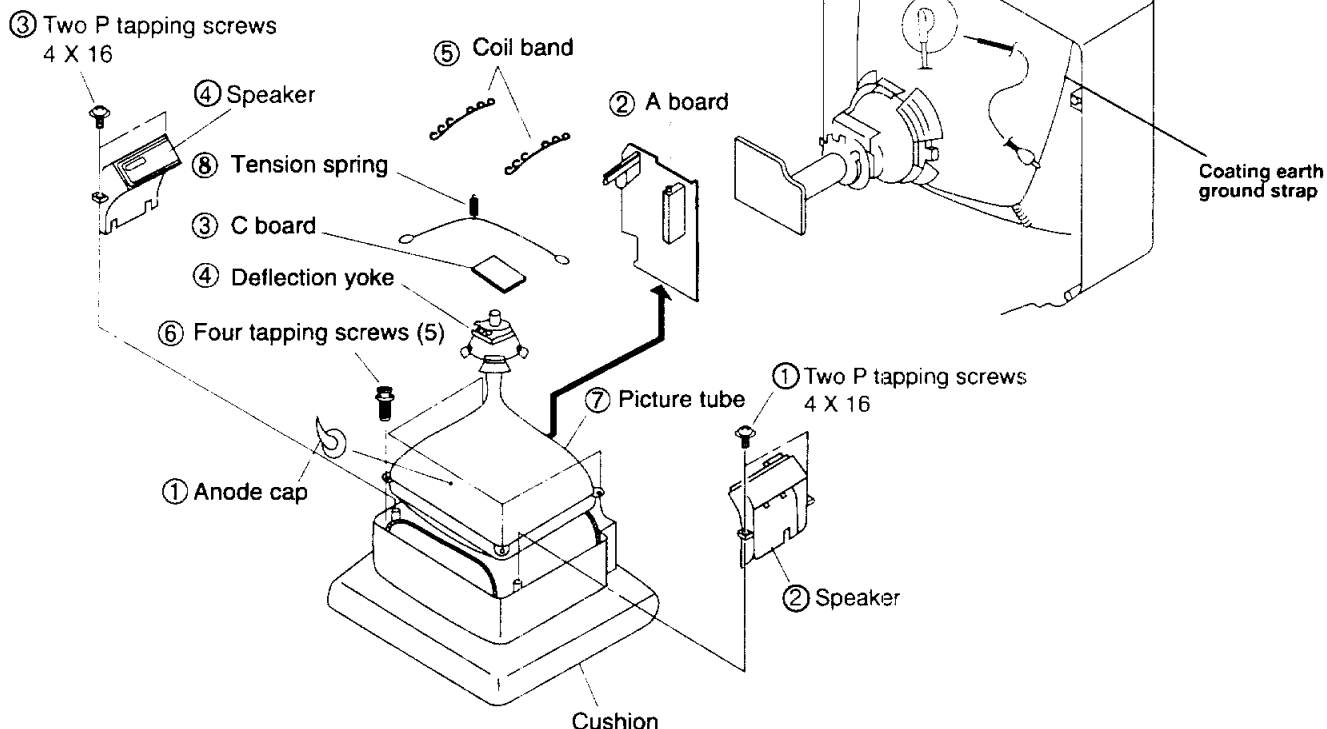


2-4. PICTURE TUBE REMOVAL

WARNING Before removing anode cap:

H.V. remains in the CRT even after the power is disconnected.

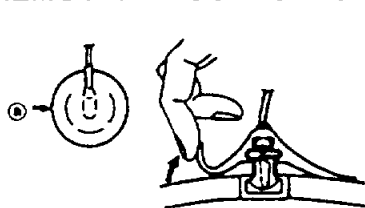
To avoid electrical shock before attempting to remove the anode cap, discharge CRT: Short between anode and CRT coating earth ground strap.



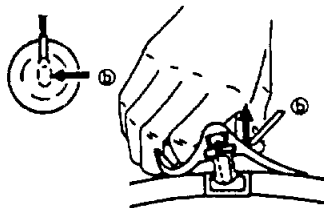
• REMOVAL OF THE ANODE-CAP

NOTE: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon painted on the CRT, after removing the anode.

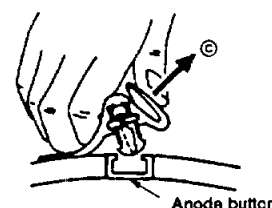
• REMOVAL PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by arrow ①.



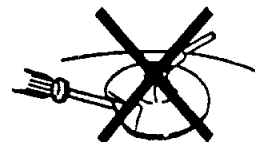
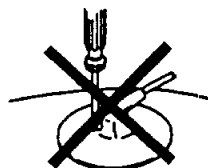
② Use your thumb to pull the rubber cap firmly in the direction indicated by arrow ②.



③ When one side of the rubber cap separates from the anode button, the anode-cap can be removed by turning the rubber cap and pulling it in the direction of arrow ③.

• HOW TO HANDLE AN ANODE-CAP

- ① Do not use sharp objects which may cause damage to the surface of the anode-cap.
- ② Do not squeeze the rubber covering too hard to avoid damaging the anode-cap. A material fitting called a shatter-hook terminal is built into the rubber.
- ③ Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



SECTION 3 SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed. These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch should be set as follows unless otherwise noted:

PICTURE control normal

BRIGHTNESS control normal

- Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2) and White Balance

Note: Test Equipment Required

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

3-1. BEAM LANDING

Preparation:

- Feed in the white pattern signal.
- Before starting, degauss the entire screen.

1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown in Fig.2.
3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are at the sides evenly. (Fig.3)
5. Move the deflection yoke forward, and adjust so that the entire screen becomes green. (Fig.1)
6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. When landing at the corner is not right, adjust by using the disk magnets. (Fig.4)

purity control

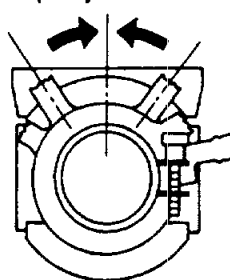


Fig. 2

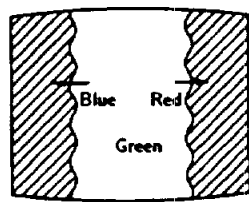


Fig. 3

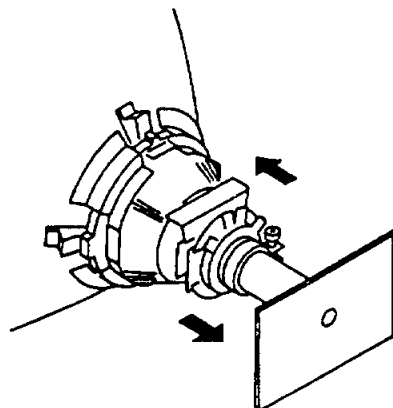


Fig. 1

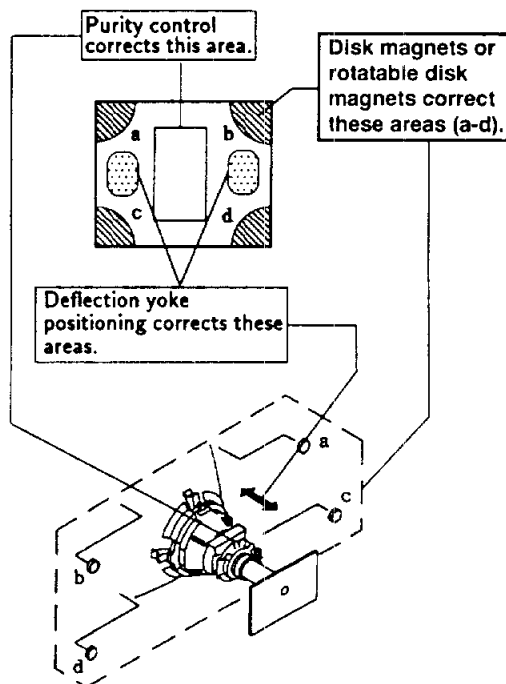


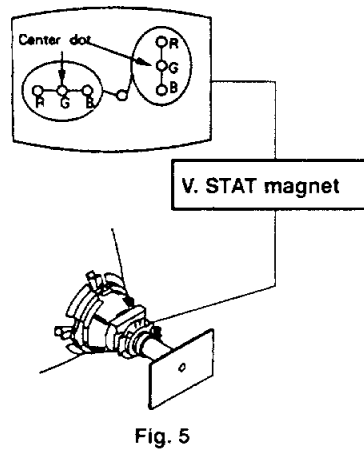
Fig. 4

3-2. CONVERGENCE

Preparation:

- Before starting, perform FOCUS, V. LIN and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in dot pattern.

(1) Vertical Static Convergence

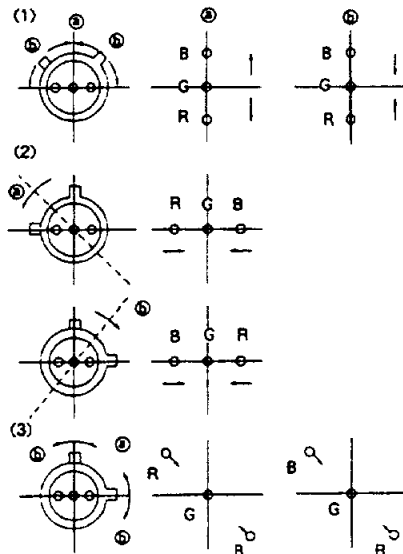


1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)

Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



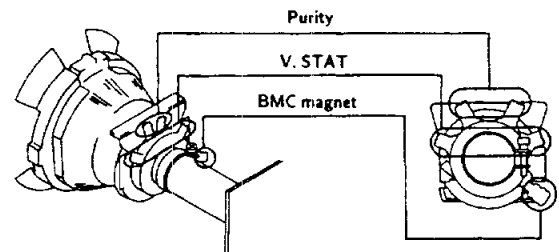
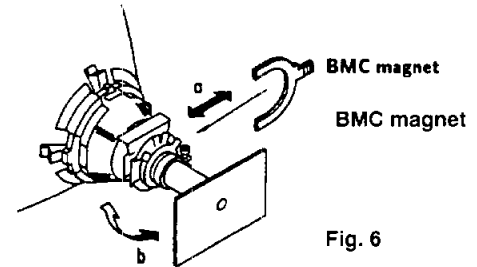
2. When the V. STAT magnet is moved in the direction of arrow (a) and (b), red, green, and blue dots move as shown below:



If the blue dot does not converge with red and green dots, perform the following steps:

- Move BMC magnet (a) to correct insufficient H. Static convergence.
- Rotate BMC magnet (b) to correct insufficient V. Static convergence.

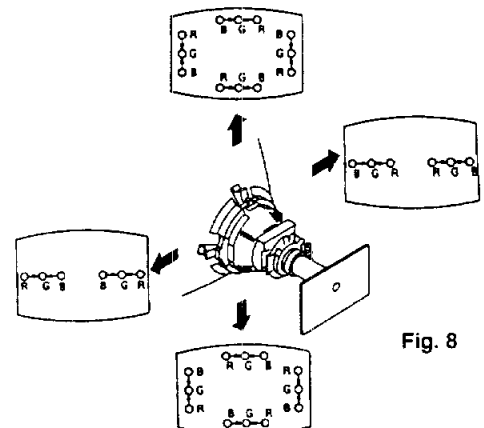
In either case, repeat Beam Landing Adjustment.



(2) Dynamic Convergence Adjustment

Preparation:

- Before starting to perform Horizontal and Vertical Static Convergence Adjustment.
1. Slightly loosen deflection yoke screw.
 2. Remove deflection yoke spacers.
 3. Move the deflection yoke for best convergence as shown below.
 4. Tighten the deflection yoke screw.
 5. Install the deflection yoke spacers.



(3) Screen-corner Convergence

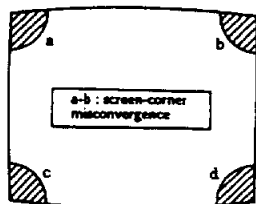
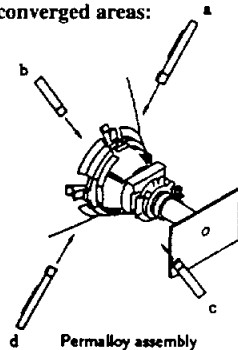


Fig. 9

Affix a permalloy assembly corresponding to the misconverged areas:



3-3. FOCUS

- Adjust FOCUS control for best picture.

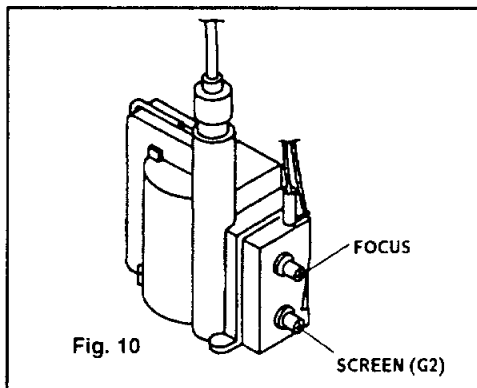


Fig. 10

3-4. SCREEN (G2)

- Input a dots pattern.
- Set the PICTURE and BRIGHT controls at minimum and COLOR control at normal.
- Adjust SBRT, GCUT, BCUT in service mode so that voltages on the red, green, and blue cathodes are 170Vdc with an oscilloscope as shown in Fig. 11.
- Observe the screen and adjust SCREEN (G2)VR to obtain the faintly visible background of dot signal.

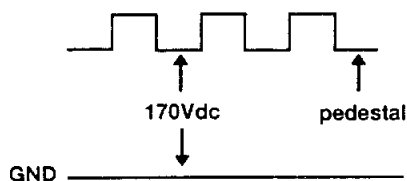


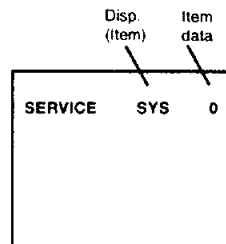
Fig. 11

3-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

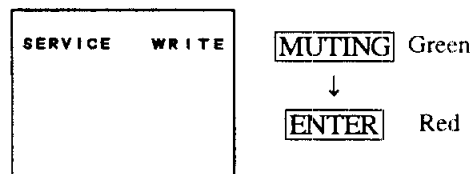
- Standby mode. (Power off)
- DISPLAY** → **5** → **VOL(+)** → **POWER** on the Remote Commander. (Press each button within a second.)

SERVICE ADJUSTMENT MODE IN



- The CRT displays the item being adjusted.
- Press **1** or **4** on the Remote Commander to select the item.
- Press **3** or **6** on the Remote Commander to change the data.
- Press **MUTING** then **ENTER** to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



- Turn set off and on to exit.

3-6. WHITE BALANCE ADJUSTMENTS

- Input an entire white signal.
- Set to Service adjustment Mode.
- Set the PICTURE and BRIGHT to minimum.
- Adjust with SBRT if necessary.
- Select GCUT and BCUT with **1** and **4**.
- Adjust with **3** and **6** for the best white balance.
- Set the PICTURE and BRIGHT to maximum.
- Select GDRV and BDRV with **1** and **4**.
- Adjust with **3** and **6** for the best white balance.
- Write into the memory by pressing **MUTING** then **ENTER**.

SECTION 4 SAFETY RELATED ADJUSTMENTS

A BOARD

☑ R525 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ☑ on the schematic diagram).

IC301, IC502, IC601, D505, D506, D507, D510, DY, C503, C511, C513, C528, R511, R519, R520, R523, R525, R527, R559, R560, R617, R618, T504 (FBT)

1. PREPARATION BEFORE CONFIRMATION

- 1) Turn the POWER switch ON. Input an entirely white signal and set the PICTURE and BRIGHT controls to maximum.
- 2) Confirm that the voltage at TP85 is more than 90VDC when the set is operating normally with 120.0 ± 2.0 VAC supply. (KV-21RS50/21R22/21RD2/21SD2/21PM2/21PS2 ONLY) or 220 ± 2.0 VAC supply (KV-21RS50C/21RS22C/21R22C).

2. HOLD-DOWN OPERATION CONFIRMATION

- 1) Connect the current meter between Pin 11 of the FBT (T504) and the PCB land where Pin 11 would normally attach.
- 2) Input a white signal and adjust the ABL current to be $1440 \pm 100\mu\text{A}$ using the PICTURE and the BRIGHT controls.
- 3) Confirm the voltage of A board TP-91 is 113.2 ± 0.5 VDC.
- 4) Connect the DC power supply via diode 1SS119 and Digital Voltmeter to TP-85.
- 5) Increase the DC power voltage gradually until the picture blanks out.
- 6) Read the digital voltmeter indication.
- 7) Turn DC power source off immediately.

STANDARD

Less than or equal to 127.3 VDC

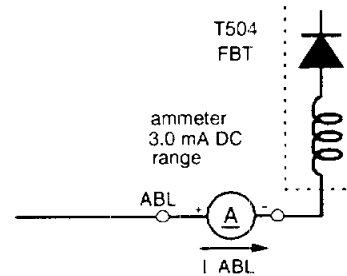
- 8) Input a dot signal and adjust the ABL current to be $95+100/-95\mu\text{A}$ using the PICTURE and the BRIGHT controls.
- 9) Confirm the voltage of A board TP-91 is 116.7 ± 0.5 VDC.
- 10) Repeat steps from (4) to (7).

STANDARD

Less than or equal to 127.3 VDC

3. HOLD-DOWN READJUSTMENT

If the current setting indicated in step 2-2 cannot be met, readjustment should be performed by altering the resistance value of R525 (a component marked with ☑).

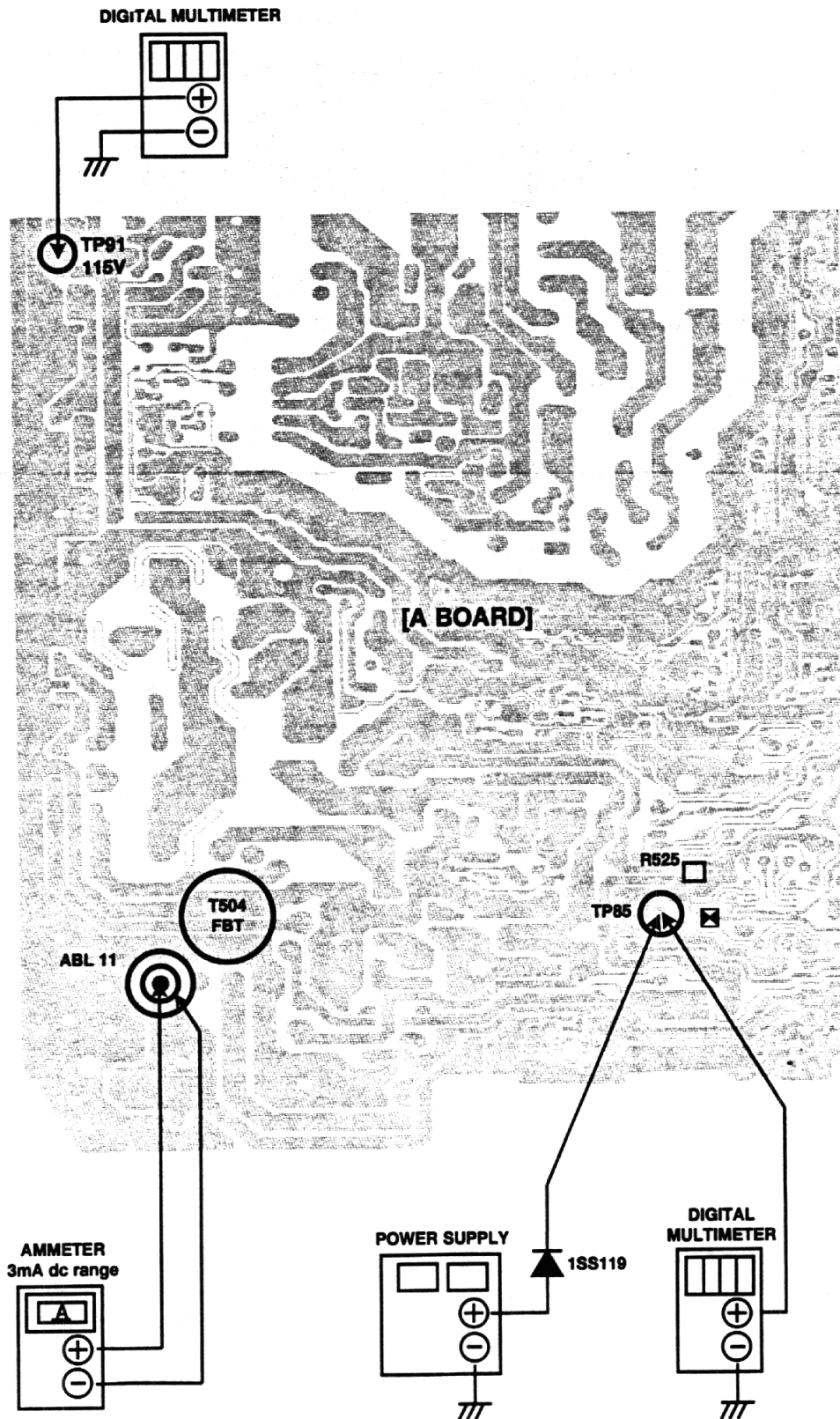


B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

The following adjustments should always be performed when replacing the following components.

IC001, IC601, R030, R617, R618, R629, R630, R651, R652, R654, R655, R656

- 1) Supply 130 ± 2.0 V AC (KV-21RS50/21R22/21RD2/21SD2/21PM2/21PS2 ONLY) or 220 ± 2.0 VAC (KV-21RS50C/21RS22C/21R22C) to the set with a variable auto transformer.
- 2) Input a dot signal.
- 3) Set the PICTURE control and the BRIGHT control to minimum condition.
- 4) Set to service adjustment mode.
- 5) Select PADJ with [1] and [4].
- 6) Adjust with [6] to the 0 level.
- 7) Confirm the voltage of A BOARD TP-91 is less than 123.0V DC.
- 8) If step 7 is not satisfied, replace the components, repeat the above steps.
- 9) Supply 120.0 ± 2.0 VAC (KV-21RS50/21R22/21RD2/21SD2/21PM2/21PS2 ONLY) or 220 ± 2.0 VAC (KV-21RS50C/21RS22C/21R22C) to the set with a variable auto transformer.
- 10) Adjust with [3] and [6] for the 116.7 ± 0.5 V DC.
- 11) Write into the memory by pressing [MUTING] then [ENTER].



SECTION 5 CIRCUIT ADJUSTMENTS

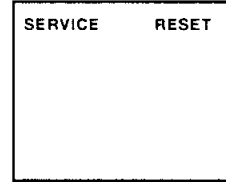
5-1. ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER

Use Remote Commander (RM-Y145/Y146) to perform circuit adjustments on this model.

NOTE : Test Equipment Required.

1. Pattern Generator
2. Frequency Counter
3. Digital Multimeter
4. Audio OSC

7. Press **[8]** then **[ENTER]** on the Remote Commander to initialize.



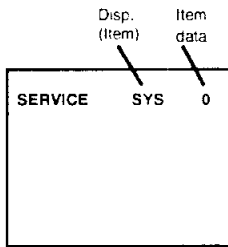
Carry out step 7 when adjusting IDs 0 to 4 and when replacing and adjusting IC003.

1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

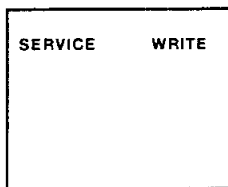
1. Standby mode. (Power off)
2. **[DISPLAY]** → **[5]** → **[VOL (+)]** → **[POWER]** on the Remote Commander. (Press each button within a second.)

SERVICE ADJUSTMENT MODE IN



3. The CRT displays the item being adjusted.
4. Press **[1]** or **[4]** on the Remote Commander to select the item.
5. Press **[3]** or **[6]** on the Remote Commander to change the data.
6. Press **[MUTING]** then **[ENTER]** to write into memory.

SERVICE ADJUSTMENT MODE MEMORY

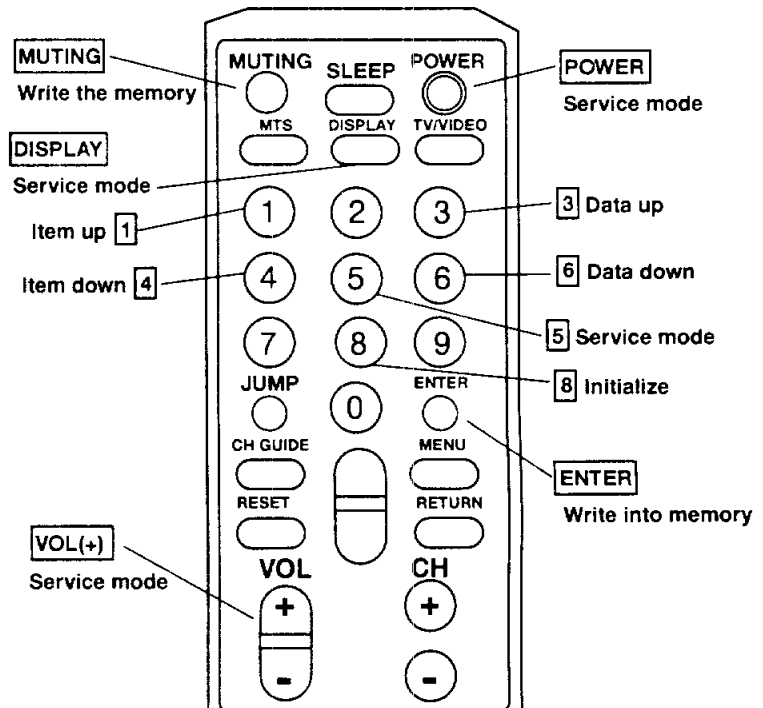


[MUTING] Green
↓
[ENTER] Red

2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, pull out the plug from the AC outlet, then replace the plug in the AC outlet again.
2. Turn the power switch ON and set to service mode.
3. Call the adjusted items again to confirm they were adjusted.

3. ADJUST BUTTONS AND INDICATOR



RM-Y145
RM-Y146

4. AN ITEM OF ADJUSTMENTS

No.	Disp.	Item	Data range	Avg. data
1	AFC	AFC Loop Gain	0~3	*1
2	VPOS	V. Position	0~31	12
3	VSIZ	V. Size	0~63	23
4	VLIN	V. Linearity	0~15	8
5	VSCO	S. Correction	0~15	5
6	HPOS	H. Position	0~15	10
7	GDRV	Green-Drive	0~31	19
8	BDRV	Blue-Drive	0~31	16
9	GCUT	Green-Cutoff	0~15	6
10	BCUT	Blue Cut Off	0~15	8
11	TOT	Chroma TOT-Filter	0, 1	*1
12	NR	Noise Reduction	0, 1	*0
13	SCON	Sub-Contrast	0~15	8
14	SHUE	Sub-Hue	0~15	8
15	SCOL	Sub-Color	0~15	9
16	SBRT	Sub-Brightness	0~63	22
17	SSHP	Sub-Sharpness	0~15	*10
18	RON	Red-Off	0, 1	*1
19	GON	Green-Off	0, 1	*1
20	BON	Blue-Off	0, 1	*1
21	PREL	Pre-Over Shoot	0~7	*4
22	AXIS	Axis SW	0, 1	*1
23	DCOL	Dynamic-Color	0, 1	*0
24	REF	Reference-Position	0~3	*3
25	ABLM	ABL Mode	0~3	*2
26	CROM	Chroma Trap SW	0, 1	*0
27	OSDL	OSD Level	0, 1	1
28	Y-DC	DC Transmission	0~7	*5
29	GMMA	Gamma	0~7	*0
30	VEXT	V Sync Extend	0, 1	*1
31	VZOM	HV Comp	0~7	*4
32	CDMD	V Countdown	0, 1	*0
33	RGBL	RGB Limit	0~3	*3
34	YDLY	Y Delay	0~3	*0
35	SBAL	Left-Volume	0~15	7
36	SBAS	Sub-Bass	0~15	9
37	STRE	Sub-Treble	0~15	7
38	DISP	Display Position	0~63	6
39	PADJ	B+ Adjustment	0~63	35
40	ID0	ID0	0~256	by Model
41	ID1	ID1	0~256	by Model
42	ID2	ID2	0~256	by Model
43	ID3	ID3	0~256	by Model
44	ID4	ID4	0~256	by Model

* : Fixed value

Note: No.1 through 44 show adjustment order.

SERVICE	ID0	25
---------	-----	----

Note: IC001 on circuit board A inputs a V. Sync signal to pin ⑤ and is always in operation. If a V. Sync signal is input to pin ⑤ there will be a waiting period of 2-4 seconds, and the power is shut off. When entering the service mode, the above function is cancelled and operation is possible.

Adjust the function values as shown below when IC003 on A board is replaced.

KV-21RS50C/21RS50

No.	Disp.	Data
40	ID0	25
41	ID1	1
42	ID2	11
43	ID3	195
44	ID4	23

KV-21RS22C/21SD2/21PS2

No.	Disp.	Data
40	ID0	25
41	ID1	1
42	ID2	3
43	ID3	195
44	ID4	23

KV-21R22C/21R22/21RD2/21PM2

No.	Disp.	Data
40	ID0	25
41	ID1	1
42	ID2	0
43	ID3	194
44	ID4	23

5-2. A BOARD ADJUSTMENTS

RF AGC ADJUSTMENT (IF BLOCK VR)

1. Input a color-bar signal.
2. Adjust AGC VR of TU101 so that snow, noise, and cross-modulation disappear from the picture.
3. Verify picture quality on each channel.

H. FREQUENCY ADJUSTMENT

1. Input a monoscope signal.
2. Set to Service adjustment Mode.
3. Connect a frequency counter to base of Q550 (TP-86 H. DRIVE).
4. Select the item of AFC, set to 3 level (free run).
5. Check H. Frequency for the 15800 ± 100 Hz.
6. Select the item of AFC again, adjust the level "1".
7. Write into the memory by pressing **MUTING** then **ENTER**.

V. FREQUENCY ADJUSTMENT

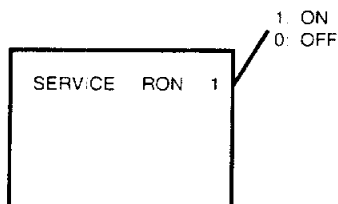
1. Select video 1 with no signal input.
2. Set the conditions with standard setting.
3. Connect the frequency counter across CN501 VDY (+) (pin 6) connector and ground.
4. Check V. Frequency for the 60 ± 2 Hz.

SUB CONTRAST ADJUSTMENT (SCON)

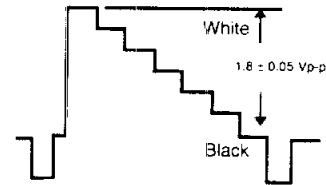
1. Input a color-bar signal.
2. Select the red color.
3. Set to Service adjustment Mode.
4. Select the item DCOL to "1" level.
5. Set the conditions as follows.

PICTURE MAX
COLOR MIN
BRIGHT CENTER

R ON ON (1)
G ON OFF (0)
B ON OFF (0)



6. Connect an oscilloscope to CN703 Pin ① (R OUT) of C board and ground.
7. Select SCON with **1** and **4**.
8. Adjust with **3** and **6** for: 1.8 ± 0.05 Vp-p.



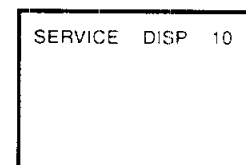
9. Reset the item DCOL to "0" level.
10. Write the memory by pressing **MUTING** then **ENTER**.
11. Return the following back to normal after adjustment.

PICTURE MAX
COLOR CENTER
BRIGHT CENTER

R ON ON (1)
G ON ON (1)
B ON ON (1)

DISPLAY POSITION ADJUSTMENT (DISP)

1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Select DISP with **1** and **4**.
4. Adjust with **3** and **6** for adjustment of characters to center.
5. Write the memory by pressing **MUTING** then **ENTER**.
6. Check if the text is displayed on the screen.

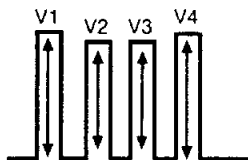


SUB BRIGHT ADJUSTMENT (SBRT)

1. Input a cross-hatch signal.
2. Set to Service adjustment Mode.
3. Set the PICTURE and BRIGHT to minimum.
4. Select SBRT with **[1]** and **[4]**.
5. Adjust with **[3]** and **[6]** to obtain a faintly visible cross-hatch.
6. Write into the memory by pressing **[MUTING]** then **[ENTER]**.

SUB HUE, SUB COLOR ADJUSTMENT (SHUE, SCOL)

1. Input a color-bar signal.
2. Set to Service adjustment Mode.
3. Select the item DCOL and set to "1" level.
4. Connect an oscilloscope to CN703 Pin ③ (B OUT) of C board.
5. Select SHUE and SCOL with **[1]** and **[4]**.
6. Adjust with **[3]** and **[6]** for the $V1 = V4 \pm 0.1V_{p-p}$ (SCOL) and $V2 = V3 \pm 0.1V_{p-p}$ (SHUE).



7. After Sub-Color/Hue adjustment, increase 2 steps on (SCOL).
8. Reset the item DCOL to "0" level.
9. Write into the memory by pressing **[MUTING]** then **[ENTER]**.

V. SIZE ADJUSTMENT (VSIZ)

1. Input a cross-hatch signal.
2. Set to Service adjustment Mode.
3. Select VSIZ with **[1]** and **[4]**.
4. Adjust with **[3]** and **[6]** for the best vertical size.

V. SIZE (VSIZ)

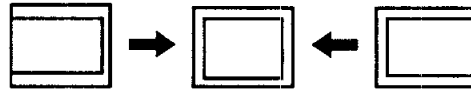


H. CENTER ADJUSTMENT (HPOS)

Note : Perform this adjustment after checking H. FREQUENCY.

1. Input a cross-hatch signal.
2. Set the Service adjustment Mode.
3. Select HPOS with **[1]** and **[4]**.
4. Adjust with **[3]** and **[6]** for the best horizontal center.
5. Write into the memory by pressing **[MUTING]** then **[ENTER]**.

H. CENTER (HPOS)



V. LINEARITY (VLIN) AND V CORRECTION (VSCO) ADJUSTMENTS.

1. Input a cross-hatch signal.
2. Set to Service adjustment Mode.
3. Select VLIN and VSCO with **[1]** and **[4]**.
4. Adjust with **[3]** and **[6]** for the best picture.
5. Write the memory by pressing **[MUTING]** then **[ENTER]**.

V LINEARITY (VLIN)



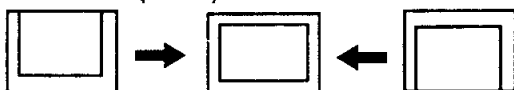
V CORRECTION (VSCO)



V. CENTER ADJUSTMENT (VPOS)

1. Input a cross-hatch signal.
2. Set to Service adjustment Mode.
3. Select VPOS with **[1]** and **[4]**.
4. Adjust with **[3]** and **[6]** for the best vertical center.
5. Write into the memory by pressing **[MUTING]** then **[ENTER]**.

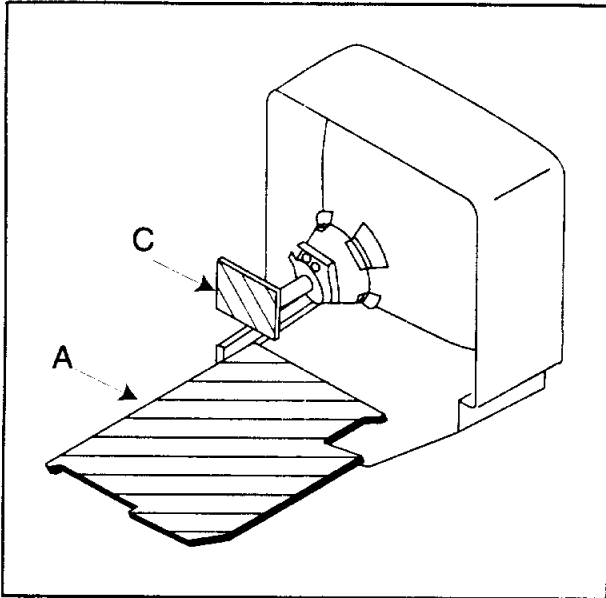
V. CENTER (VPOS)



SECTION 6 DIAGRAMS



6-2. Circuit Boards Location










6-3. Printed Wiring Boards and Schematic Diagrams

Note:




- All capacitors are in μF unless otherwise noted.
pF: μF 50WV or less are not indicated except for electrolytic and tantalums.
- All electrolytics are 50V unless otherwise specified
- Indication of resistance, which does not have one for rating electrical power, is as follows:

Pitch: 5mm
Rating electrical power 1/4W


- All resistors are in ohms.
 $\text{K}\Omega=1000\Omega$, $\text{M}\Omega=1000\text{K}\Omega$
-  nonflammable resistor.
- Δ : internal component.
- : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- The components identified by  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- When replacing components identified by  make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by  and repeat the adjustment until the specified value is achieved.
(Refer to R525 on pages 14 & 15).
- When replacing parts in the table below be sure to perform the related adjustment.

Part replaced ()	Adjustment ()
IC301, IC502, IC601, D505, D506, D507, D510, DY, C503, C511, C513, C528, R511, R519, R520, R523, R525, R527, R559, R560, R617, R618, T504 (FBT)	HV HOLD-DOWN (R525)
IC001, IC601, R030, R617, R618, R629, R630, R651, R652, R654, R655, R656	B+ VOLTAGE CONFIRMATION

- All voltages are in V.
- Voltage is DC with respect to ground unless otherwise noted.
- Readings are taken with a 10M Ω digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerance.
- Circled numbers are waveform references.


-  : B + Line
-  : B - Line
-  : signal path

Reference Information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NON FLAMMABLE CARBON
	: FUSE	NON FLAMMABLE FUSIBLE
	: RW	NON FLAMMABLE WIREWOUND
	: RS	NON FLAMMABLE METAL OXIDE
	: RB	NON FLAMMABLE CEMENT
	: 	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

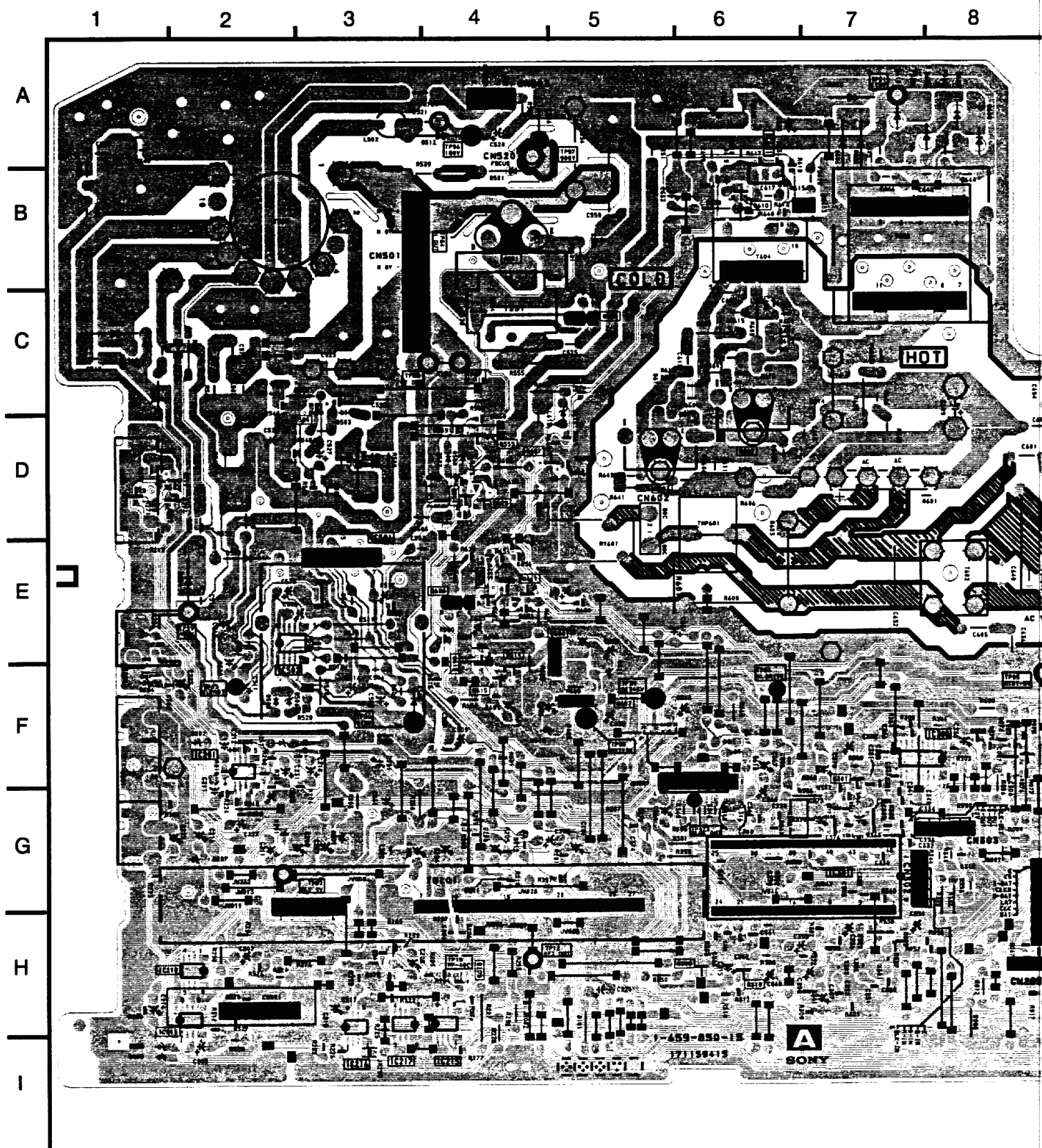
Note: The symbol  display is on the component side.

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

The symbol  indicates fast operating fuse. Replace only with fuse of same rating as marked.

A TUNING CONTROL, Y/C/J,
POWER SUPPLY, DEFLECTION,
TUNER/IF, AUDIO MTS

— A BOARD —



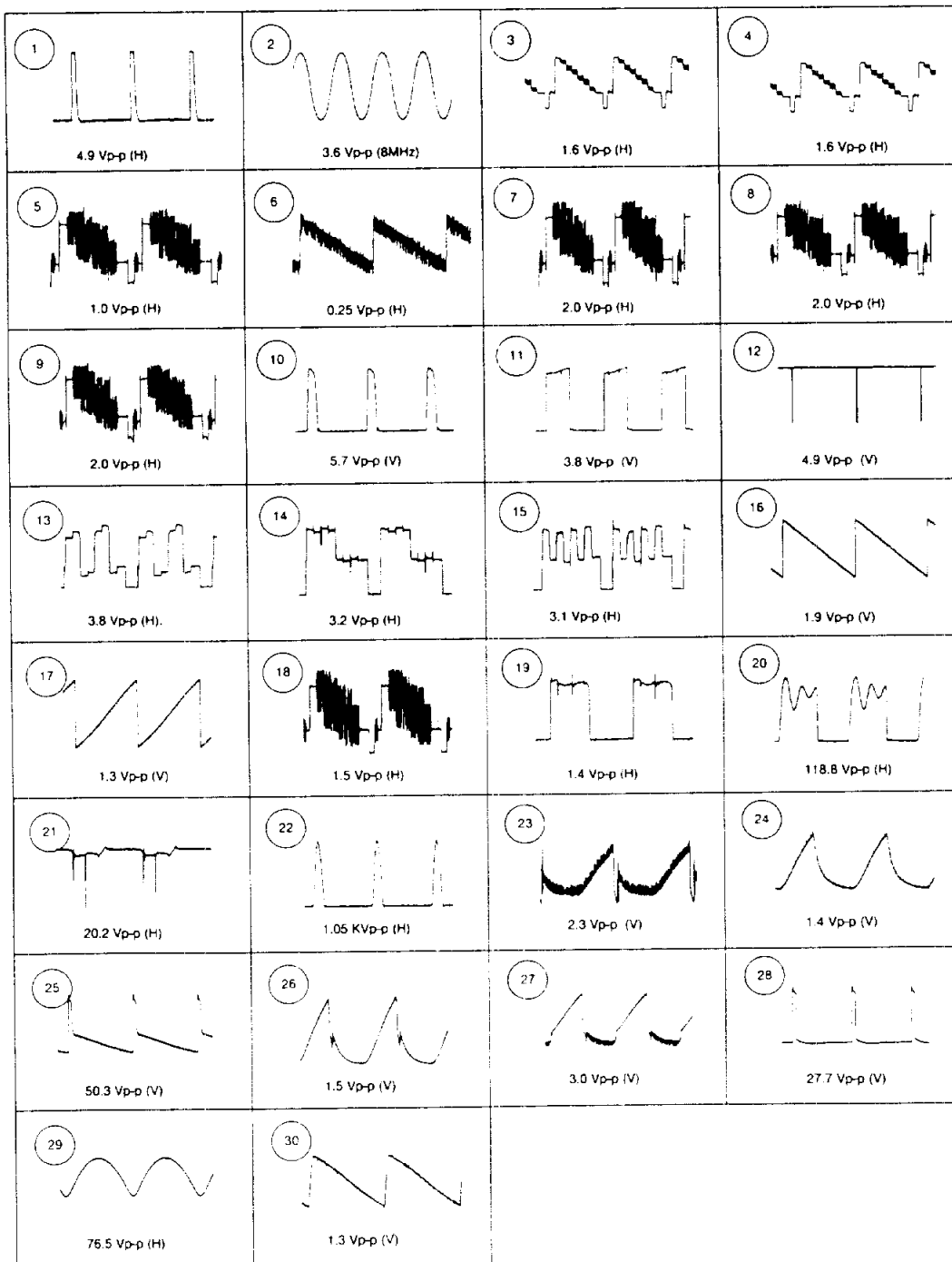
8 9 10 11 12

A BOARD SEMICONDUCTOR LOCATION

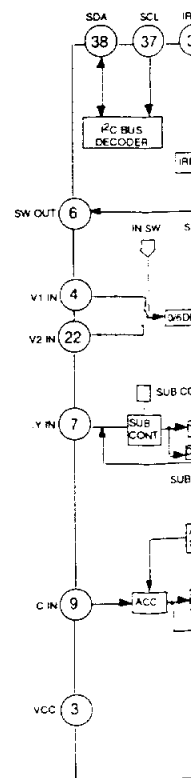
IC		DIODE	
IC001	G-10	D001	H-10
IC003	G-9	D201	G-3
IC103	F-11	D203	F-2
IC201	F-2	D205	H-1
IC210	H-2	D206	H-1
IC211	H-2	D207	G-2
IC215	H-4	D225	H-11
IC216	H-3	D226	H-11
IC217	H-4	D227	H-11
IC301	G-7	D310	H-10
IC405	E-11	D502	F-3
IC408	D-11	D503	C-3
IC501	D-3	D504	E-2
IC502	E-3	D505	F-2
IC601	A-6	D506	G-3
IC693	F-10	D507	D-4
CM301	H-2	D509	C-1
TRANSISTOR		D510	D-2
Q205	H-4	D512	A-4
Q210	D-1	D514	C-2
Q211	D-1	D515	D-3
Q301	F-7	D601	D-8
Q305	H-6	D602	D-5
Q405	D-10	D603	C-6
Q504	C-3	D604	C-6
Q550	C-5	D605	A-7
Q551	B-4	D606	A-7
Q601	D-4	D607	A-8
Q602	C-6	D608	A-8
Q603	D-5	D609	A-7
Q605	D-4	D610	A-7
Q606	E-5	D611	E-5
Q607	F-5	D612	F-4
Q610	A-6	D613	A-7
Q612	E-4	D614	C-5
Q613	E-4	D615	C-6
Q614	E-4	D619	A-6
Q615	E-4		

NOTE:
Portions of the circuit marked as shown are high voltage areas. Use care to prevent electric shock during inspection or repair.

• A BOARD WAVEFORMS

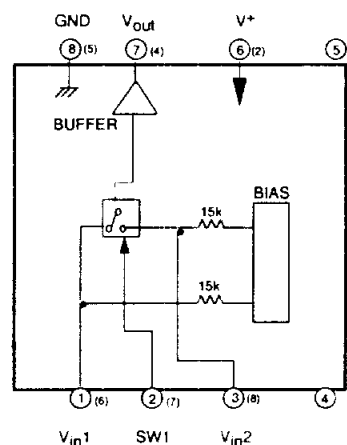


A BOARD IC301

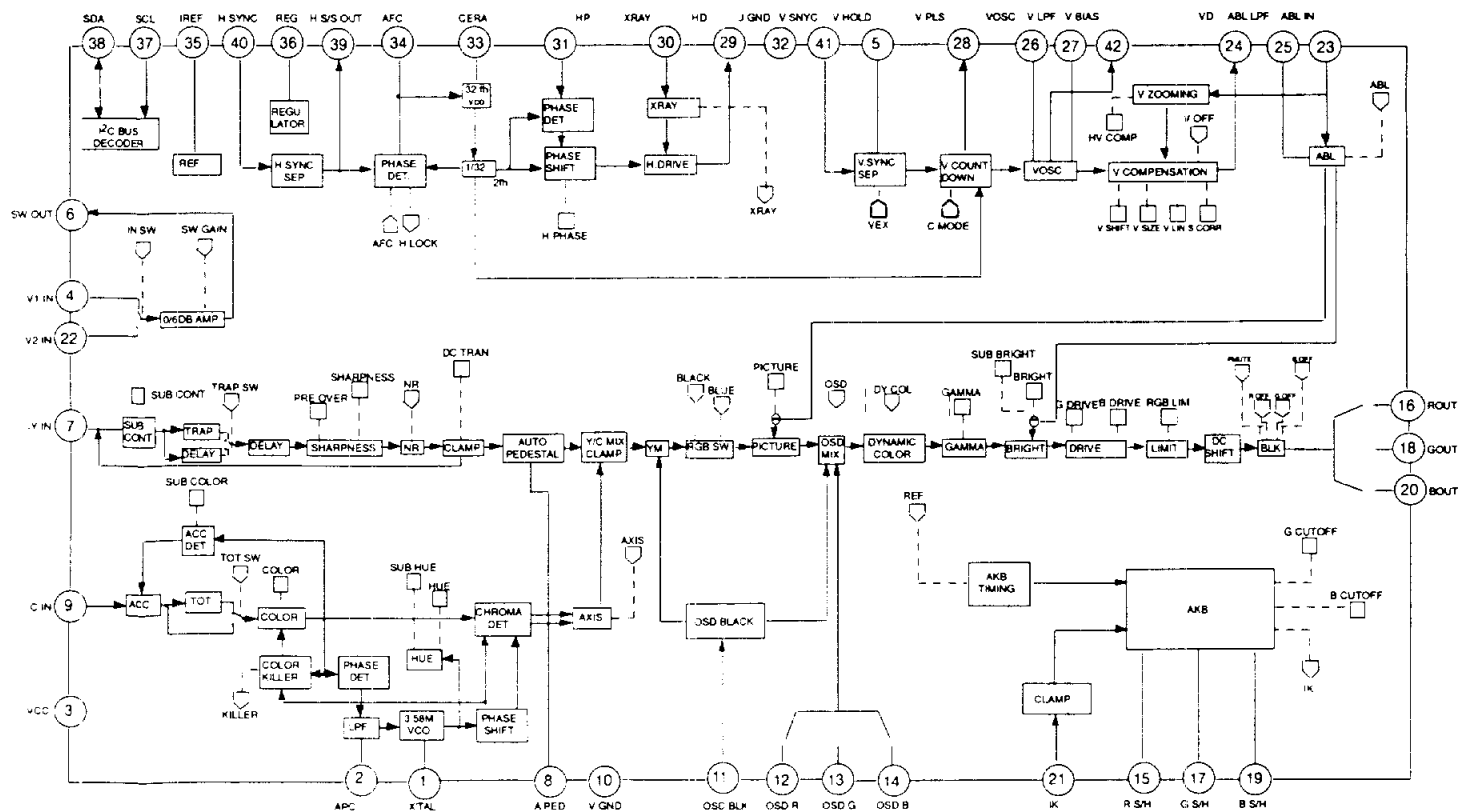


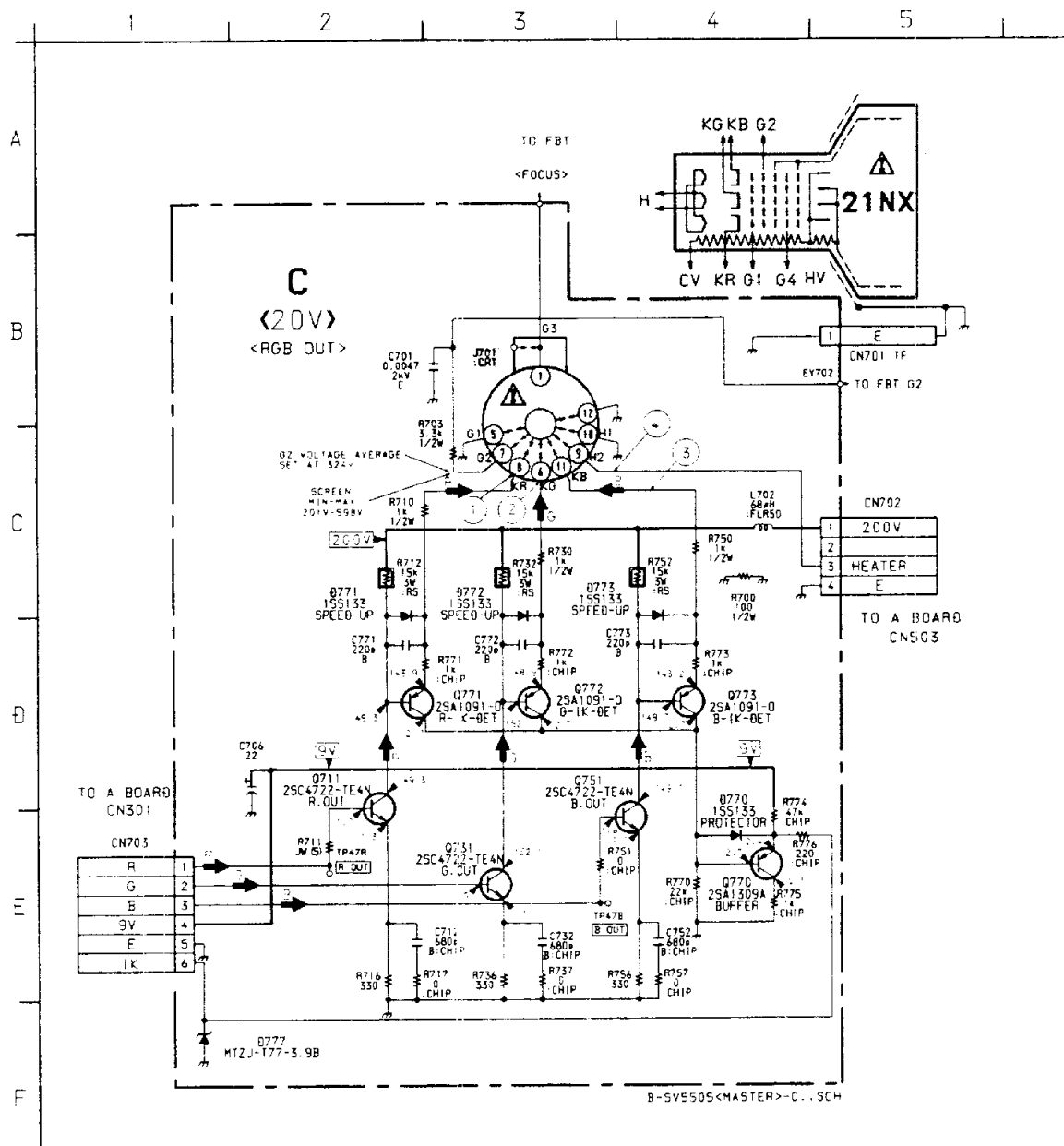
shown are high
11 electric shocks

A BOARD IC215, IC216
NJM2233BM



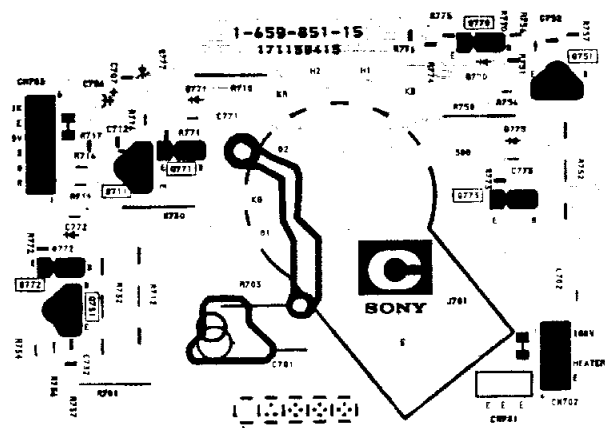
A BOARD IC301 CXA1870S





C [R,G,B OUT]

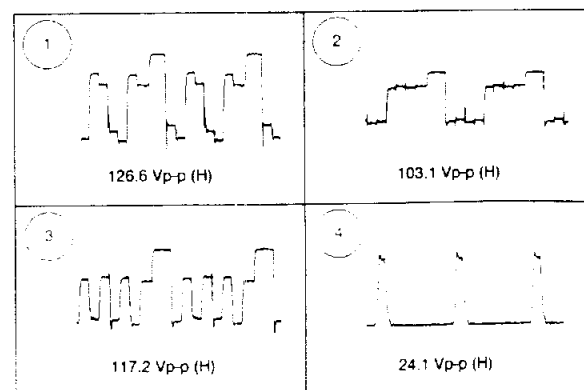
— C BOARD —



Schematic diagrams

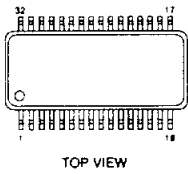
← A board

• C BOARD WAVEFORMS

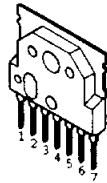


6-4. SEMICONDUCTORS

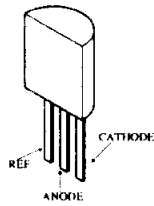
BH3856FS



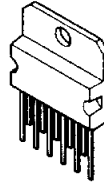
LA7830



uPC1093J-1-T

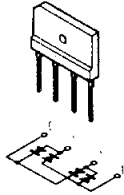


TDA2009A

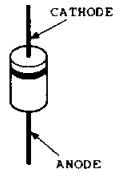


1SS119-25TD
1SS133T-77
MTZJ-T-77-10B
MTZJ-T-77-2.2
MTZJ-T-77-3.3B
MTZJ-T-77-30D
MTZJ-T-77-5.1C
MTZJ-T-77-5.6C
MTZJ-T-77-8.2B

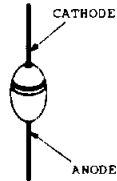
D3SB60F



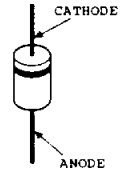
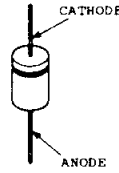
D1NL20-TA
EL1Z-V1
RGP10GPKG3



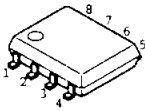
GP08DPKG3



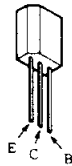
D2S4MTA1



NJM2245M-TE2
NJM2233BM(TE2)
NJM2234(TE2)
NJM4558M-TE2



2SD2137-OP-TA



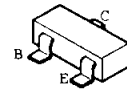
2SD1877S-SONY-CA



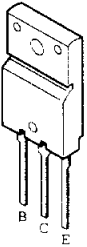
2SC3209LK-TP
2SD1292



2SA1330-T106
2SB709A-QRS-TX
2SD601A-QRS-TX



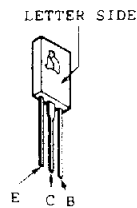
2SC5271-ROYG-F



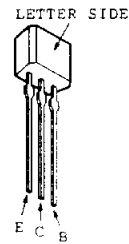
2SA1091-0



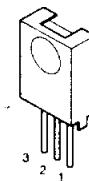
2SC2611



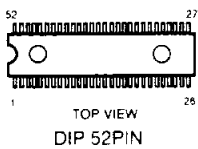
2SA1175-HFE



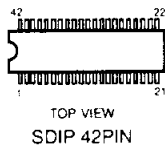
SBX1790-51



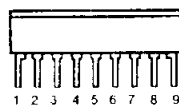
M37267M6 - 059SP



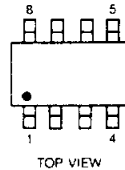
CXA1870S



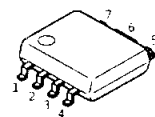
uPC1406HA



ST24C01FM6TR



MM1319



SECTION 5 EXPLODED VIEWS

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The component parts of an assembly are indicated by the reference numbers in the remarks column.

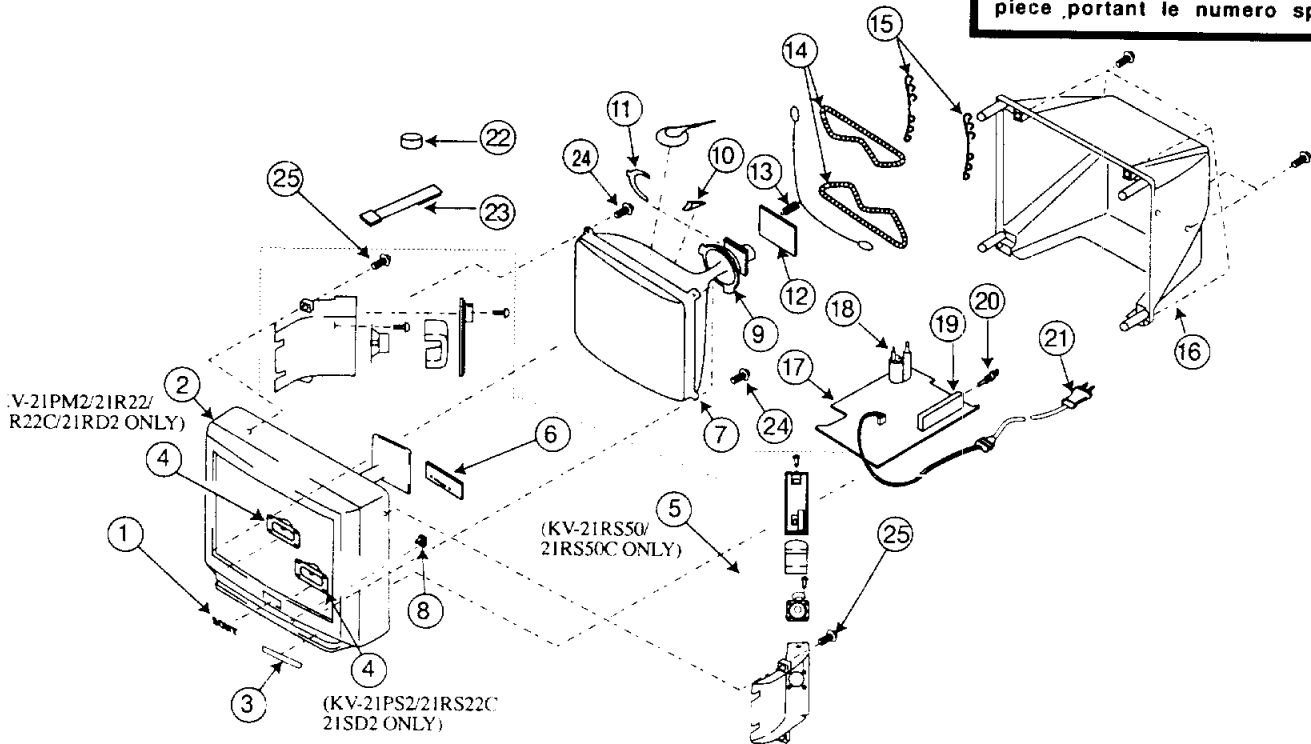
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Note:

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note:

Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	4-046-161-01	EMBLEM (NO.8) SONY	
2	X-4034-611-1	BEZNET, ASSY (KV-21PM2)	
2	X-4034-371-1	BEZNET, ASSY (KV-21PS2/21RS22C)	
2	X-4034-372-2	BEZNET, ASSY (KV-21R22/21R22C)	
2	X-4034-367-1	BEZNET, ASSY (KV-21RD2)	
2	X-4034-366-1	BEZNET, ASSY (KV-21RS50/21RS50C)	
2	X-4034-368-2	BEZNET, ASSY (KV-21SD2)	
3	4-052-641-21	DOOR, CONTROL (KV-21PM2)	
3	4-052-641-01	DOOR, CONTROL (KV-21PS2/21R22/21R22C/21RS22C)	
3	4-052-641-51	DOOR, CONTROL (KV-21RD2)	
3	4-052-641-61	DOOR, CONTROL (KV-21SD2)	
3	4-058-075-01	DOOR, CONTROL (KV-21RS50/21RS50C)	
4	1-505-507-11	SPEAKER (9x5) (EXCEPT KV-21RS50/21RS50C)	
5	1-505-404-11	SPEAKER (8CM) (KV-21RS50/21RS50C)	
6	4-052-639-01	BUTTON, MULTI (EXCEPT KV-21RS50/21RS50C)	
6	4-054-278-01	BUTTON, MULTI (KV-21RS50/21RS50C)	
7 Δ	8-738-768-05	CRT 21NX (A51LDG50X) (KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)	
7 Δ	8-738-781-05	CRT 21NX (A51LDG50X) (KV-21R22C/21RS22C/21RS50C)	
8	4-052-675-01	GUIDE, LED (EXCEPT KV-21RS50/21RS50C)	
9 Δ	4-451-440-11	DY Y21NXA	
10	4-053-005-01	SPACER, DY	
11	1-452-277-00	MAGNET, BMC	
12 *	A-1331-518-A	C BOARD, MOUNTED	
13	4-375-394-01	SPRING, TENSION	

REF.NO.	PART NO.	DESCRIPTION	REMARK
14	1-409-707-31	COIL, DEMAGNETIZATION (KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)	
14	1-411-986-11	COIL, DEMAGNETIZATION (KV-21R22C/21RS22C/21RS50C)	
15	4-369-319-11	BAND, DEGAUSSING COIL (KV-21RS50)	
16	4-052-643-31	REAR COVER (KV-21PM2/21R22/21R22C/21RD2)	
16	4-052-643-41	REAR COVER (KV-21PS2/21RS22C/21SD2)	
16	4-058-077-01	REAR COVER (KV-21RS50/21RS50C)	
17 *	A-1298-079-A	A BOARD, COMPLETE (KV-21PM2/21RD2)	
17 *	A-1298-080-A	A BOARD, COMPLETE (KV-21PS2/21SD2)	
17 *	A-1298-078-A	A BOARD, COMPLETE (KV-21R22)	
17 *	A-1298-084-A	A BOARD, COMPLETE (KV-21R22C)	
17 *	A-1298-083-A	A BOARD, COMPLETE (KV-21RS22C)	
17 *	A-1298-029-A	A BOARD, COMPLETE (KV-21RS50)	
17 *	A-1298-085-A	A BOARD, COMPLETE (KV-21RS50C)	
18 Δ	1-453-211-11	TRANSFORMER ASSY, FLYBACK (NX1744//X4E4)	
19	8-598-339-00	TUNER BTF-LA402 (KV-21PM2/21R22/21R22C/21RD2)	
19	8-598-341-00	TUNER BTF-WA405 (KV-21SD2/21PS2/21RS50/21RS50C/21RS22C)	
20	1-766-374-11	PLUG, F PIN	
21	1-751-057-11	CORD, POWER (WITH CONNECTOR) 10A/125V (KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)	
21	1-769-796-31	CORD, POWER (WITH CONNECTOR) 10A/250V (KV-21R22C/21RS22C/21RS50C)	
22	1-452-032-00	MAGNET, DISC	
23	4-051-735-22	PIECE (A) 75 CONVERSION CORRECTION	
24	4-365-808-01	SCREW (5), TAPPING	
25	4-384-096-01	SCREW (4X16) TAPPING +P (KV-21RS50/21RS50C)	



SECTION 7 ELECTRICAL PARTS LIST

Note:

The components identified by shading and mark **Δ** are critical for safety. Replace only with part number specified.

Note:

Les composants identifiés par un trame et une marque **Δ** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

The components identified by **Δ** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

CAPACITORS

- MF : μ F

INDUCTORS

- UH : μ H

When indicating parts by reference number, please include the board name.

REF.NO. PART NO. DESCRIPTION REMARK



- * A-1298-079-A A BOARD, COMPLETE (KV-21PM2/21RD2)
- * A-1298-080-A A BOARD, COMPLETE (KV-21PS2/21SD2)
- * A-1298-078-A A BOARD, COMPLETE (KV-21R22)
- * A-1298-084-A A BOARD, COMPLETE (KV-21R22C)
- * A-1298-083-A A BOARD, COMPLETE (KV-21RS22C)
- * A-1298-029-A A BOARD, COMPLETE (KV-21RS50)
- * A-1298-085-A A BOARD, COMPLETE (KV-21RS50C)

1-533-223-11 HOLDER, FUSE

- * 1-900-800-67 CONNECTOR ASSY, 6P MINI MICRO

4-382-854-11 SCREW (M3X10), P, SW (+)

7-682-949-01 SCREW +PSW 3X10

CAPACITOR

C001	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C003	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C004	1-104-664-11	ELECT	47MF	20%	25V
C008	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C010	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C011	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
		(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)			
C012	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
		(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)			
C014	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C017	1-126-960-11	ELECT	1MF	20%	50V
C019	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C020	1-137-399-11	FILM	0.1MF	5%	50V
C023	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C024	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C025	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C026	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C028	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C030	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C034	1-163-037-11	CERAMIC CHIP	0.022MF	10%	50V
C037	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C038	1-126-941-11	ELECT	470MF	20%	25V
C046	1-104-664-11	ELECT	47MF	20%	25V
C047	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C048	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V

REF.NO. PART NO. DESCRIPTION REMARK

C050	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C051	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C052	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C053	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C060	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C062	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C091	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C092	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C101	1-126-963-11	ELECT	4.7MF	20%	50V
C202	1-126-964-11	ELECT	10MF	20%	50V
C203	1-126-963-11	ELECT	4.7MF	20%	50V
		(KV-21RS50/21RS50C)			
C204	1-104-665-11	ELECT	100MF	20%	25V
C205	1-126-959-11	ELECT	0.47MF	20%	50V
C206	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C208	1-126-960-11	ELECT	1MF	20%	50V
		(KV-21PM2/21R22/21R22C/21RD2)			
C211	1-126-959-11	ELECT	0.47MF	20%	50V
		(KV-21RS50/21RS50C)			
C212	1-126-959-11	ELECT	0.47MF	20%	50V
		(KV-21RS50/21RS50C)			
C214	1-126-960-11	ELECT	1MF	20%	50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)			
C215	1-126-964-11	ELECT	10MF	20%	50V
C216	1-126-959-11	ELECT	0.47MF	20%	50V
C221	1-126-960-11	ELECT	1MF	20%	50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)			
C222	1-126-960-11	ELECT	1MF	20%	50V
C227	1-126-963-11	ELECT	4.7MF	20%	50V
		(KV-21RS50/21RS50C)			
C229	1-126-960-11	ELECT	1MF	20%	50V
C250	1-126-964-11	ELECT	10MF	20%	50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)			
C301	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C303	1-126-942-61	ELECT	1000MF	20%	25V
C315	1-104-664-11	ELECT	47MF	20%	25V
C330	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C352	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C353	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C354	1-126-959-11	ELECT	0.47MF	20%	50V
C355	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V

Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK
C356	1-126-934-11	ELECT	220MF 20% 16V
C358	1-126-959-11	ELECT	0.47MF 20% 50V
C359	1-126-959-11	ELECT	0.47MF 20% 50V
C360	1-126-963-11	ELECT	4.7MF 20% 50V
C361	1-137-399-11	FILM	0.1MF 5% 50V
C362	1-137-399-11	FILM	0.1MF 5% 50V
C363	1-137-399-11	FILM	0.1MF 5% 50V
C364	1-126-959-11	ELECT	0.47MF 20% 50V
C366	1-126-960-11	ELECT	1MF 20% 50V
C367	1-126-963-11	ELECT	4.7MF 20% 50V
C368	1-136-169-00	FILM	0.22MF 5% 50V
C369	1-164-004-11	CERAMIC CHIP	0.1MF 10% 25V
C373	1-137-370-11	FILM	0.01MF 5% 50V
C374	1-163-259-91	CERAMIC CHIP	220PF 5% 50V
C375	1-126-963-11	ELECT	4.7MF 20% 50V
C376	1-164-232-11	CERAMIC CHIP	0.01MF 10% 50V
C378	1-126-961-11	ELECT	2.2MF 20% 50V
C379	1-164-232-11	CERAMIC CHIP	0.01MF 10% 50V
C381	1-126-960-11	ELECT	1MF 20% 50V
C382	1-104-665-11	ELECT	100MF 20% 25V
C383	1-163-017-00	CERAMIC CHIP	0.0047MF 10% 50V
C390	1-137-399-11	FILM	0.1MF 5% 50V
C408	1-126-964-11	ELECT	10MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C408	1-126-959-11	ELECT	0.47MF 20% 50V
		(KV-21PM2/21R22/21R22C/21RD2)	
C410	1-126-964-11	ELECT	10MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C412	1-126-964-11	ELECT	10MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C413	1-126-964-11	ELECT	10MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C436	1-126-961-11	ELECT	2.2MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C436	1-137-399-11	FILM	0.1MF 5% 50V
		(KV-21PM2/21R22/21R22C/21RD2)	
C437	1-126-961-11	ELECT	2.2MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C438	1-126-933-11	ELECT	100MF 20% 16V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C439	1-126-965-11	ELECT	22MF 20% 50V
C440	1-126-933-11	ELECT	100MF 20% 16V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C441	1-126-961-11	ELECT	2.2MF 20% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C442	1-136-169-00	FILM	0.22MF 5% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C443	1-126-941-11	ELECT	470MF 20% 25V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C444	1-126-941-11	ELECT	470MF 20% 25V

REF.NO.	PART NO.	DESCRIPTION	REMARK
C447	1-136-169-00	FILM	0.22MF 5% 50V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C448	1-136-173-00	FILM	0.47MF 5% 50V
C490	1-126-941-11	ELECT	470MF 20% 25V
C491	1-126-942-61	ELECT	1000MF 20% 25V
		(KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)	
C491	1-126-941-11	ELECT	470MF 20% 25V
		(KV-21PM2/21R22/21R22C/21RD2)	
C502	1-126-965-11	ELECT	22MF 20% 50V
C503	1-107-698-11	ELECT	10MF 20% 25V
C504	1-130-489-00	FILM	0.033MF 5% 50V
C505	1-102-963-00	CERAMIC	33PF 5% 50V
C507	1-102-038-00	CERAMIC	0.001MF 500V
C508	1-102-038-00	CERAMIC	0.001MF 500V
C509	1-126-968-11	ELECT	100MF 20% 50V
C510	1-108-702-11	MYLAR	0.068MF 10% 100V
C511	1-126-963-11	ELECT	4.7MF 20% 50V
C512	1-163-031-11	CERAMIC CHIP	0.01MF 50V
C513	1-126-964-11	ELECT	10MF 20% 50V
C514	1-104-664-11	ELECT	47MF 20% 25V
C515	1-126-941-11	ELECT	470MF 20% 25V
C516	1-102-244-00	CERAMIC	220PF 10% 500V
C517	1-126-941-11	ELECT	470MF 20% 25V
C518	1-126-941-11	ELECT	470MF 20% 25V
C519	1-102-244-00	CERAMIC	220PF 10% 500V
C520	1-107-652-11	ELECT	10MF 20% 250V
C521	1-102-244-00	CERAMIC	220PF 10% 500V
C522	1-123-024-21	ELECT	33MF 160V
C523 Δ	1-136-105-00	FILM	0.33MF 5% 200V
C525	1-106-387-00	MYLAR	0.068MF 10% 200V
C527 Δ	1-126-965-11	ELECT	22MF 20% 50V
C528	1-107-635-11	ELECT	4.7MF 20% 160V
C530	1-104-664-11	ELECT	47MF 20% 25V
C553	1-102-228-00	CERAMIC	470PF 10% 500V
C554 Δ	1-109-881-11	FILM	0.0057MF 3% 2KV
C555	1-162-115-00	CERAMIC	330PF 10% 2KV
C558	1-137-350-11	MYLAR	0.015MF 10% 100V
C559 Δ	1-162-115-00	CERAMIC	330PF 10% 2KV
C575	1-106-371-00	MYLAR	0.015MF 99% 200V
C579	1-106-367-00	MYLAR	0.01MF 10% 200V
C601 Δ	1-113-920-11	CERAMIC	0.0022MF 20% 250V
C605 Δ	1-113-920-11	CERAMIC	0.0022MF 20% 250V
C609 Δ	1-125-731-11	ELECT	270MF 20% 400V
		(KV-21R22C/21RS22C/21RS50C)	
C609 Δ	1-104-759-11	ELECT	470MF 20% 200V
		(KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C610	1-165-127-11	CERAMIC	470PF 10% 500V
		(KV-21R22C/21RS22C/21RS50C)	
C610	1-164-625-11	CERAMIC	680PF 10% 500V
		(KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	



Note: The components identified by shading and mark **Δ** are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque **Δ** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REF.NO.	PART NO.	DESCRIPTION	REMARK
C611	1-165-127-11	CERAMIC 470PF 10% 500V (KV-21R22C/21RS22C/21RS50C)	
C611	1-164-625-11	CERAMIC 680PF 10% 500V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C612	1-136-171-00	FILM 0.33MF 5% 50V	
C613	1-136-171-00	FILM 0.33MF 5% 50V	
C614 Δ	1-137-219-11	FILM 0.015MF 5% 800V (KV-21R22C/21RS22C/21RS50C)	
C614 Δ	1-136-759-11	FILM 0.039MF 5% 630V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C615	1-164-625-11	CAPACITOR 680PF 10% 500V (KV-21R22C/21RS22C/21RS50C)	
C615	1-164-735-11	CAPACITOR 0.0015MF 10% 500V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C617	1-137-366-11	FILM 0.0022MF 5% 50V (KV-21R22C/21RS22C/21RS50C)	
C617	1-137-367-11	FILM 0.0033MF 5% 50V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C619	1-106-347-00	MYLAR 0.0015MF 10% 200V (KV-21R22C/21RS22C/21RS50C)	
C619	1-106-355-12	MYLAR 0.0033MF 10% 200V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C622	1-126-942-61	ELECT 1000MF 20% 25V	
C623	1-123-024-21	ELECT 33MF 160V	
C625	1-104-665-11	ELECT 100MF 20% 25V	
C628	1-104-664-11	ELECT 47MF 20% 25V	
C631	1-104-664-11	ELECT 47MF 20% 25V	
C632	1-126-959-11	ELECT 0.47MF 20% 50V	
C633	1-126-961-11	ELECT 2.2MF 20% 50V	
C636 Δ	1-113-920-11	CERAMIC 0.0022MF 20% 250V	
C638 Δ	1-113-920-11	CERAMIC 0.0022MF 20% 250V	
C640 Δ	1-136-311-61	FILM 0.47MF 20% 300V (KV-21R22C/21RS22C/21RS50C)	
C640 Δ	1-136-311-11	FILM 0.47MF 20% 125V (KV-21RD2/21PM2/21SD2/21PS2)	
C641	1-136-167-00	FILM 0.15MF 5% 50V	
C642	1-136-167-00	FILM 0.15MF 5% 50V	
C643	1-165-127-11	CERAMIC 470PF 10% 500V	
C644	1-165-127-11	CERAMIC 470PF 10% 500V	
C645	1-165-127-11	CERAMIC 470PF 10% 500V	
C646	1-165-127-11	CERAMIC 470PF 10% 500V	
C652	1-136-311-11	FILM 0.47MF 20% 125V (KV-21RS50/21R22)	
C653	1-113-910-11	CERAMIC 470PF 10% 250V (KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)	
C685	1-126-960-11	ELECT 1MF 20% 50V	
C690	1-126-959-11	ELECT 0.47MF 20% 50V	
C691	1-126-941-11	ELECT 470MF 20% 25V	
C692	1-104-664-11	ELECT 47MF 20% 25V	
C693	1-136-173-00	FILM 0.47MF 5% 50V	

REF.NO.	PART NO.	DESCRIPTION	REMARK
FILTER			
CF001	1-767-487-21	VIBRATOR, CRYSTAL	
CONNECTOR			
CN203 *	1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P	
CN401	1-564-505-11	PLUG, CONNECTOR 2P (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)	
CN402	1-564-505-11	PLUG, CONNECTOR 2P	
CN501 *	1-580-798-11	CONNECTOR PIN (DY) 6P	
CN601 *	1-580-843-11	PIN, CONNECTOR (POWER)	
CN602	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
DIODE			
D001	8-719-921-44	DIODE MTZJ-5.1C	
D002	1-810-039-21	LED UNIT	
D201	8-719-982-22	DIODE MTZJ-30D	
D203	8-719-109-66	DIODE RD3.3ES-T1B2 (KV-21RS50/21RS50C)	
D205	8-719-110-17	DIODE RD10ESB2	
D206	8-719-110-17	DIODE MTZJT-10B (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)	
D207	8-719-110-17	DIODE RD10ESB2	
D310	8-719-921-44	DIODE MTZJ-5.1C	
D403	8-719-991-33	DIODE 1SS133T-77	
D415	8-719-982-96	DIODE MTZJT-2.2A (KV-21PM2/21R22/21R22C/21RD2)	
D502	8-719-908-03	DIODE GP08D	
D503	8-719-991-33	DIODE 1SS133T-77	
D504	8-719-302-43	DIODE EL1Z	
D505	8-719-991-33	DIODE 1SS133T-77	
D506	8-719-110-08	DIODE RD8.2ESB2	
D507	8-719-991-33	DIODE 1SS133T-77	
D509	8-719-302-43	DIODE EL1Z	
D510	8-719-302-43	DIODE EL1Z	
D512	8-719-302-43	DIODE EL1Z	
D514	8-719-991-33	DIODE 1SS133T-77	
D515	8-719-302-43	DIODE EL1Z	
D601 Δ	8-719-510-51	DIODE D3SB60F	
D602	8-719-991-33	DIODE 1SS133T-77	
D603	8-719-911-19	DIODE 1SS119-25	
D604	8-719-911-19	DIODE 1SS119-25	
D605	8-719-022-97	DIODE D2S4MF	
D606	8-719-022-97	DIODE D2S4MF	
D607	8-719-510-26	DIODE D1NL20-TA	
D608	8-719-510-26	DIODE D1NL20-TA	
D609	8-719-510-26	DIODE D1NL20-TA	
D610	8-719-510-26	DIODE D1NL20-TA	
D611	8-719-110-17	DIODE RD10ESB2	
D612	8-719-109-89	DIODE RD5.6ESB2	

Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



REF.NO.	PART NO.	DESCRIPTION	REMARK
D613 Δ	8-719-057-53	DIODE EZ0150V1	
D614	8-719-911-19	DIODE 1SS119-25	
D615	8-719-911-19	DIODE 1SS119-25	
D619	8-719-911-19	DIODE 1SS119-25	

FUSE

F601 Δ	1-533-795-11	LINK, FUSE	
---------------	--------------	------------	--

FERRITE BEAD

FB501	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB601	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB602	1-412-911-11	INDUCTOR, FERRITE BEAD	
FB605	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB606	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	

FB607	1-410-396-41	FERRITE BEAD INDUCTOR 0.45UH	
FB611	1-412-911-11	INDUCTOR, FERRITE BEAD	

IC

IC001	8-759-450-53	IC M37267M6-151SP	
IC003	8-759-354-27	IC ST24C01FM6TR	
IC103	8-742-014-10	IC SBX1981-51	
IC201	8-759-100-96	IC NJM4558M (KV-21RS50/21RS50C)	
IC215	8-759-710-86	IC NJM2233BM	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)

IC216	8-759-710-86	IC NJM2233BM	
IC301	8-752-070-52	IC CXA1870S	
IC402	8-759-365-39	IC TDA7267 (KV-21PM2/21R22/21R22C/21RD2)	
IC406	8-759-145-27	IC μ PC1406HA	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
IC408	8-759-980-43	IC TDA2009A	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)

IC501	8-759-801-98	IC LA7830	
IC502	8-759-100-96	IC UPC4558G2	
IC601	8-759-198-31	IC UPC1093J-1-T	
IC693	8-759-371-21	IC MM1319AFBE	

JACK

J200	1-580-441-11	JACK, PIN 2P (KV-21RS50/21RS50C)	
J201	1-580-441-31	JACK, PIN 2P (KV-21PM2/21R22/21R22C/21RD2)	
J201	1-580-443-11	JACK, PIN 3P	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
J400	1-568-267-21	JACK	

CHIP CONDUCTOR

JR002	1-216-295-91	CONDUCTOR, CHIP	(2012)
JR007	1-216-295-91	CONDUCTOR, CHIP	(2012)
JR290	1-216-295-91	CONDUCTOR, CHIP	(2012)

REF.NO.	PART NO.	DESCRIPTION	REMARK
---------	----------	-------------	--------

COIL

L001	1-410-470-11	INDUCTOR	10UH
L002	1-408-421-00	INDUCTOR	100UH
L003	1-408-421-00	INDUCTOR	100UH
L202	1-410-470-11	INDUCTOR	10UH
L316	1-410-671-31	INDUCTOR	47UH

L501	1-412-553-11	INDUCTOR	3.3mH
L502	1-410-669-31	INDUCTOR	33UH
L503 Δ	1-412-531-31	INDUCTOR	33UH
L551	1-412-533-21	INDUCTOR	47UH
L612	1-412-529-11	INDUCTOR	22UH

IC LINK

PS401	1-532-637-00	LINK, IC 1A/150V	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
-------	--------------	------------------	---

TRANSISTOR

Q205	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q210	8-729-422-27	TRANSISTOR 2SD601 (KV-21RS50/21RS50C)	
Q211	8-729-422-27	TRANSISTOR 2SD601 (KV-21RS50/21RS50C)	
Q301	8-729-216-22	TRANSISTOR 2SA1162-G	
Q305	8-729-216-22	TRANSISTOR 2SA1162-G	

Q405	8-729-216-22	TRANSISTOR 2SB709A	(KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
Q406	8-729-422-27	TRANSISTOR 2SD601A-Q	(EXCEPT KV-21RS50/21RS50C)

Q504 Δ	8-729-105-08	TRANSISTOR 2SA1330-O6	
Q550	8-729-140-50	TRANSISTOR 2SC3209LK	
Q551 Δ	8-729-810-49	TRANSISTOR 2SD1877S-SONY-CA	

Q601	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q602 Δ	8-729-016-15	TRANSISTOR 2SC4833MNP	(KV-21R22C/21RS22C/21RS50C)

Q602 Δ	8-729-035-37	TRANSISTOR 2SC5271-ROYG-F	(KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)
---------------	--------------	---------------------------	---

Q603 Δ	8-729-016-15	TRANSISTOR 2SC4833MNP	(KV-21R22C/21RS22C/21RS50C)
---------------	--------------	-----------------------	-----------------------------

Q603 Δ	8-729-035-37	TRANSISTOR 2SC5271-ROYG-F	(KV-21PM2/21PS2/21RD2/21R22/21RS50/21SD2)
---------------	--------------	---------------------------	---

Q605	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q606	8-729-423-99	TRANSISTOR 2SD2137-OP-TA	
Q607	8-729-111-55	TRANSISTOR 2SD1312-K	
Q610	8-729-216-22	TRANSISTOR 2SA1162-G	
Q612	8-729-422-27	TRANSISTOR 2SD601A-Q	

Q613	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q614	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q615	8-729-422-27	TRANSISTOR 2SD601A-Q	



Note: The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REF.NO.	PART NO.	DESCRIPTION	REMARK
RESISTOR			
R001	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R002	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R003	1-216-033-00	METAL GLAZE	220 5% 1/10W
R005	1-249-429-11	CARBON	10K 5% 1/4W
R006	1-216-295-91	CONDUCTOR, CHIP	(2012)
R007	1-249-421-11	CARBON	2.2K 5% 1/4W
R008	1-216-033-00	METAL GLAZE	220 5% 1/10W
R009	1-216-033-00	METAL GLAZE	220 5% 1/10W
R010	1-216-033-00	METAL GLAZE	220 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R011	1-216-033-00	METAL GLAZE	220 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R012	1-247-815-91	CARBON	220 5% 1/4W
R013	1-216-081-00	METAL GLAZE	22K 5% 1/10W
R014	1-216-033-00	METAL GLAZE	220 5% 1/10W
R015	1-216-033-00	METAL GLAZE	220 5% 1/10W
R016	1-216-041-00	METAL GLAZE	470 5% 1/10W
R017	1-216-113-00	METAL GLAZE	470K 5% 1/10W
R018	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R019	1-249-425-11	CARBON	4.7K 5% 1/4W
R020	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W
R021	1-216-045-00	METAL GLAZE	680 5% 1/10W
R022	1-216-047-91	METAL GLAZE	820 5% 1/10W
R023	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R025	1-216-033-00	METAL GLAZE	220 5% 1/10W
R026	1-216-033-00	METAL GLAZE	220 5% 1/10W
R027	1-216-033-00	METAL GLAZE	220 5% 1/10W
R028	1-216-041-00	METAL GLAZE	470 5% 1/10W
R029	1-249-431-11	CARBON	15K 5% 1/4W
R030	1-249-429-11	CARBON	10K 5% 1/4W
R031	1-216-045-00	METAL GLAZE	680 5% 1/10W
R032	1-216-033-00	METAL GLAZE	220 5% 1/10W
R033	1-216-033-00	METAL GLAZE	220 5% 1/10W
R038	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R039	1-216-077-00	METAL GLAZE	15K 5% 1/10W
R040	1-249-415-11	CARBON	680 5% 1/4W
R041	1-216-295-91	CONDUCTOR CHIP (2012)	(KV-21RS50/21RS50C)
R042	1-249-425-11	CARBON	4.7K 5% 1/4W (EXCEPT KV-21RS50/21RS50C)
R043	1-249-417-11	CARBON	1K 5% 1/4W
R044	1-247-815-91	CARBON	220 5% 1/4W
R045	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R046	1-247-815-91	CARBON	220 5% 1/4W
R047	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R048	1-216-025-91	METAL GLAZE	100 5% 1/10W
R049	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R050	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R051	1-216-033-00	METAL GLAZE	220 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)

REF.NO.	PART NO.	DESCRIPTION	REMARK
R054	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R055	1-216-033-00	METAL GLAZE	220 5% 1/10W
R056	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R057	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R058	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R063	1-216-295-91	CONDUCTOR, CHIP	(2012)
R070	1-249-425-11	CARBON	4.7K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R071	1-249-425-11	CARBON	4.7K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R101	1-249-429-11	CARBON	10K 5% 1/4W
R200	1-216-079-00	METAL GLAZE	18K 5% 1/10W (KV-21RS50/21RS50C)
R203	1-215-899-11	METAL OXIDE	15K 5% 2W F
R206	1-216-689-11	METAL GLAZE	39K 5% 1/10W
R207	1-216-083-00	METAL GLAZE	27K 5% 1/10W
R208	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R209	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R210	1-216-033-00	METAL GLAZE	220 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R211	1-216-049-91	METAL GLAZE	1K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R212	1-249-425-11	CARBON	4.7K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R213	1-216-113-00	METAL GLAZE	470K 5% 1/10W (KV-21RS50/21RS50C)
R216	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R217	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R218	1-216-085-00	METAL GLAZE	1K 5% 1/10W (KV-21RS50/21RS50C)
R219	1-216-049-91	METAL GLAZE	1K 5% 1/10W (KV-21RS50/21RS50C)
R220	1-216-085-00	METAL GLAZE	33K 5% 1/10W (KV-21RS50/21RS50C)
R223	1-247-807-31	CARBON	100 5% 1/4W
R224	1-216-049-91	METAL GLAZE	1K 5% 1/10W (KV-21RS50/21RS50C)
R231	1-216-113-00	METAL GLAZE	470K 5% 1/10W
R232	1-216-022-00	METAL GLAZE	75 5% 1/10W
R233	1-216-113-00	METAL GLAZE	470K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R270	1-216-113-00	METAL GLAZE	470K 5% 1/10W (KV-21RS50/21RS50C)
R271	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W (KV-21RS50/21RS50C)
R272	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W (KV-21RS50/21RS50C)
R273	1-216-097-91	METAL GLAZE	100K 5% 1/10W (KV-21RS50/21RS50C)

Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK
R274	1-216-097-91	METAL GLAZE	100K 5% 1/10W (KV-21RS50/21RS50C)
R284	1-216-033-00	METAL GLAZE	220 5% 1/10W
R285	1-216-033-00	METAL GLAZE	220 5% 1/10W
R288	1-216-079-00	METAL GLAZE	18K 5% 1/10W (KV-21RS50/21RS50C)
R291	1-216-295-91	CONDUCTOR, CHIP	(2012)
R292	1-216-295-91	CONDUCTOR, CHIP	(2012)
R293	1-216-025-91	METAL GLAZE	100 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R297	1-216-295-91	CONDUCTOR CHIP	(2012) (KV-21PM2/21R22C/21R22/21RD2)
R301	1-249-425-11	CARBON	4.7K 5% 1/4W
R302	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R306	1-249-417-11	CARBON	1K 5% 1/4W
R307	1-216-295-91	CONDUCTOR, CHIP	(2012)
R310	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R312	1-216-295-91	CONDUCTOR, CHIP	(2012)
R335	1-247-815-91	CARBON	220 5% 1/4W
R336	1-247-815-91	CARBON	220 5% 1/4W
R339	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R340	1-216-077-00	METAL GLAZE	15K 5% 1/10W
R341	1-216-113-00	METAL GLAZE	470K 5% 1/10W
R342	1-216-033-00	METAL GLAZE	220 5% 1/10W
R343	1-247-815-91	CARBON	220 5% 1/4W
R344	1-247-815-91	CARBON	220 5% 1/4W
R345	1-247-815-91	CARBON	220 5% 1/4W
R346	1-247-815-91	CARBON	220 5% 1/4W
R347	1-216-045-00	METAL GLAZE	680 5% 1/10W
R348	1-247-815-91	CARBON	220 5% 1/4W
R349	1-247-807-31	CARBON	100 5% 1/4W
R351	1-249-429-11	CARBON	10K 5% 1/4W
R353	1-249-417-11	CARBON	1K 5% 1/4W
R355	1-216-077-00	METAL GLAZE	15K 5% 1/10W
R356	1-249-421-11	CARBON	2.2K 5% 1/4W
R357	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R358	1-216-125-00	METAL GLAZE	1.5M 5% 1/10W
R360	1-216-067-00	METAL GLAZE	5.6K 5% 1/10W
R361	1-216-033-00	METAL GLAZE	220 5% 1/10W
R362	1-216-041-00	METAL GLAZE	470 5% 1/10W
R363	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R365	1-249-419-11	CARBON	1.5K 5% 1/4W
R372	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R377	1-216-295-91	CONDUCTOR, CHIP	(2012)
R411	1-216-069-00	METAL GLAZE	6.8K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R430	1-216-089-91	METAL GLAZE	47K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R430	1-216-093-00	METAL GLAZE	68K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)

REF.NO.	PART NO.	DESCRIPTION	REMARK
R432	1-216-097-91	METAL GLAZE	100K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R432	1-216-075-00	METAL GLAZE	12K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R435	1-249-425-11	CARBON	4.7K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R438	1-216-295-91	CONDUCTOR, CHIP	(2012) (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R439	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R439	1-216-295-91	CONDUCTOR, CHIP	(2012) (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R450	1-216-049-91	METAL GLAZE	1K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R460	1-216-061-00	METAL GLAZE	3.3K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R470	1-216-295-91	CONDUCTOR CHIP	(2012) (KV-21RS50/21RS50C)
R477	1-216-081-00	METAL GLAZE	22K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R479	1-216-081-00	METAL GLAZE	22K 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R480	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W (KV-21PM2/21R22/21R22C/21RD2)
R481	1-216-041-00	METAL GLAZE	470 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R482	1-249-429-11	CARBON	10K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R483	1-249-429-11	CARBON	10K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R484	1-216-013-00	METAL GLAZE	33 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R486	1-216-013-00	METAL GLAZE	33 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R487	1-249-417-11	CARBON	1K 5% 1/4W
R488	1-216-298-00	METAL GLAZE	2.2 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R489	1-249-417-11	CARBON	1K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R490	1-249-417-11	CARBON	1K 5% 1/4W
R491	1-249-411-11	CARBON	330 5% 1/4W
R492	1-249-411-11	CARBON	330 5% 1/4W
R493	1-216-298-00	METAL GLAZE	2.2 5% 1/10W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R494	1-249-417-11	CARBON	1K 5% 1/4W (KV-21PS2/21RS22C/21RS50C/21RS50/21SD2)
R495	1-216-349-00	METAL OXIDE	1 5% 1W F
R501	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R505	1-216-349-00	METAL OXIDE	1 5% 1W F
R506	1-216-453-00	METAL OXIDE	270 5% 2W F
R507	1-247-891-00	CARBON	330K 5% 1/4W
R508	1-249-417-11	CARBON	1K 5% 1/4W
R509	1-216-101-00	METAL GLAZE	150K 5% 1/10W



Note: The components identified by **A** in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Note:

The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
R510	1-249-420-11	CARBON	1.8K 5% 1/4W
R511	1-249-429-11	CARBON	10K 5% 1/4W
R512	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W
R513	1-208-773-11	METAL GLAZE	430 0.50% 1/10W
R515	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W
R518	1-215-429-00	METAL	2.2K 1% 1/4W
R519	1-216-467-11	METAL OXIDE	56K 5% 2W F
R520	1-208-777-11	METAL GLAZE	620 0.50% 1/10W
R523	1-215-469-00	METAL	100K 1% 1/4W
A R525		METAL GLAZE	1/10W
R527	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W
R531	1-216-349-00	METAL OXIDE	1 5% 1W F
R532	1-215-457-00	METAL	33K 1% 1/4W
R533	1-216-355-11	METAL OXIDE	3.3 5% 1W F
R534	1-215-457-00	METAL	33K 1% 1/4W
R536	1-215-437-00	METAL	4.7K 1% 1/4W
R538	1-215-864-00	METAL OXIDE	150 5% 1W F
R540	1-249-441-11	CARBON	100K 5% 1/4W
R542 A	1-216-093-00	METAL GLAZE	68K 5% 1/10W
R543 A	1-208-842-11	METAL GLAZE	330K 0.50% 1/10W
R544	1-208-787-11	METAL GLAZE	1.6K 0.50% 1/10W
R545 A	1-249-441-11	CARBON	100K 5% 1/4W
R547 A	1-249-429-11	CARBON	10K 5% 1/4W
R548 A	1-216-113-00	METAL GLAZE	470K 5% 1/10W
R549 A	1-216-369-00	METAL OXIDE	1 5% 2W F
R550	1-216-295-91	CONDUCTOR, CHIP (2012)	
R554	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R555 A	1-215-922-11	METAL OXIDE	6.8K 5% 3W F
R559 A	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R560	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R563	1-215-880-00	METAL OXIDE	10 5% 2W F
R590	1-216-295-91	CONDUCTOR, CHIP (2012)	
R600 A	1-247-289-00	CARBON	8.2M 5% 1W (KV-21R22C/21RS22C/21RS50C)
R601 A	1-219-513-11	RESISTOR (SURGE RESISTANT)	4.7M (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R602	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R603 A	1-202-962-11	WIREWOUND	3.3 5% 10W (KV-21R22C/21RS22C/21RS50C)
R603 A	1-205-998-11	WIREWOUND	1 5% 10W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R605	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R606	1-260-288-11	CARBON	0.47 5% 1/2W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R609	1-216-355-11	METAL OXIDE	3.3 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R609	1-216-353-00	METAL OXIDE	2.2 5% 1W F (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R610	1-216-355-11	METAL OXIDE	3.3 5% 1/4W (KV-21R22C/21RS22C/21RS50C)

R610	1-216-353-00	METAL OXIDE	2.2 5% 1W F (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R611	1-247-791-91	CARBON	22 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R611	1-249-396-11	CARBON	18 5% 1/4W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R612	1-247-791-91	CARBON	22 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R612	1-249-396-11	CARBON	18 5% 1/4W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R615	1-216-105-91	METAL GLAZE	220K 5% 1/10W (KV-21R22C/21RS22C/21RS50C)
R615	1-216-093-00	METAL GLAZE	68K 5% 1/10W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R616	1-216-057-00	METAL GLAZE	2.2K 5% 1/10W
R617	1-208-790-11	METAL GLAZE	2.2K 0.50% 1/10W
R618	1-215-469-00	METAL	100K 1% 1/4W
R619	1-216-001-00	METAL GLAZE	10 5% 1/10W
R620	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R622	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R623	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R624	1-202-933-61	FUSIBLE	0.1 10% 1/2W F (KV-21R22C/21RS22C/21RS50C)
R625	1-216-377-11	METAL OXIDE	4.7 5% 2W F
R628	1-249-415-11	CARBON	680 5% 1/4W
R629	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W
R630	1-208-826-11	METAL GLAZE	68K 0.50% 1/10W
R635	1-212-942-00	FUSIBLE	2.2 5% 1/2W F (KV-21R22C/21RS22C/21RS50C)
R635	1-212-857-00	FUSIBLE	10 5% 1/4W F (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R639	1-249-425-11	CARBON	4.7K 5% 1/4W
R640	1-216-085-00	METAL GLAZE	33K 5% 1/10W
R641	1-247-889-00	CARBON	270K 5% 1/4W
R642	1-247-889-00	CARBON	270K 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R643	1-247-889-00	CARBON	270K 5% 1/4W
R644	1-247-889-00	CARBON	270K 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R645	1-247-889-00	CARBON	270K 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R645	1-247-893-11	CARBON	390K 5% 1/4W (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
R646	1-247-889-00	CARBON	270K 5% 1/4W (KV-21R22C/21RS22C/21RS50C)
R651	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R652	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R653	1-216-065-00	METAL GLAZE	4.7K 5% 1/10W
R654	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R655	1-216-085-00	METAL GLAZE	33K 5% 1/10W

Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

A **C**

REF.NO.	PART NO.	DESCRIPTION	REMARK
R656	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R681	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R682	1-216-073-00	METAL GLAZE	10K 5% 1/10W
R683	1-215-924-00	METAL OXIDE	15K 5% 3W F
R684	1-249-429-11	CARBON	10K 5% 1/4W
R690	1-216-355-11	METAL OXIDE	3.3 5% 1W F
R704	1-216-372-11	METAL OXIDE	1.8 5% 2W F

RELAY

RY601	1-755-018-11	RELAY
-------	--------------	-------

SWITCH

S001	1-692-431-21	SWITCH, TACTILE
S002	1-692-431-21	SWITCH, TACTILE
S003	1-692-431-21	SWITCH, TACTILE
S004	1-692-431-21	SWITCH, TACTILE
S005	1-692-431-21	SWITCH, TACTILE
S006	1-692-431-21	SWITCH, TACTILE

TRANSFORMER

T504 Δ	1-453-211-11	TRANSFORMER ASSY, FLYBACK
T551 Δ	1-437-210-11	TRANSFORMER, HORIZONTAL DRIVE
T602	1-423-895-11	TRANSFORMER, LINE FILTER (LFT)
T603 Δ	1-429-483-21	TRANSFORMER, CONVERTER (PIT) (KV-21PM2/21PS2/21RS50/21R22/21RD2/21SD2)
T603 Δ	1-429-508-21	TRANSFORMER, CONVERTER (PIT) (KV-21RS22C/21R22C/21RS50C)
T604 Δ	1-427-864-11	TRANSFORMER, CONVERTER (PRT)

THERMISTOR

THP601	1-810-597-11	THERMISTOR, POSITIVE
--------	--------------	----------------------

TUNER

TU101	8-598-339-00	TUNER BTF-LA402 (KV-21PM2/21R22/21R22C/21RD2)
TU101	8-598-341-00	TUNER BTF-WA405 (KV-21SD2/21PS2/21RS50/21RS50C/21RS22C)

VARIATOR

VDR601 Δ	1-801-074-41	VARIATOR ERZV10D271
VDR640	1-809-267-41	VARIATOR ERZV10D471 (KV-21R22/21RS50)

CRYSTAL

X300	1-577-611-11	OSCILLATOR, CERAMIC
X303	1-760-190-41	VIBRATOR, CRYSTAL

REF.NO.	PART NO.	DESCRIPTION	REMARK
---------	----------	-------------	--------

C

* A-1331-518-A C BOARD, MOUNTED

1-900-800-64 CONNECTOR ASSY, 1P G2 SCREEN

CAPACITOR

C701	1-162-114-00	CERAMIC	0.0047MF	2KV
C706	1-126-965-11	ELECT	22MF	20% 50V
C712	1-163-007-11	CERAMIC CHIP	680PF	10% 50V
C732	1-163-007-11	CERAMIC CHIP	680PF	10% 50V
C752	1-163-007-11	CERAMIC CHIP	680PF	10% 50V
C771	1-102-110-00	CERAMIC	220PF	10% 50V
C772	1-102-110-00	CERAMIC	220PF	10% 50V
C773	1-102-110-00	CERAMIC	220PF	10% 50V

CONNECTOR

CN701	1-695-915-11	TAB (CONTACT)
-------	--------------	---------------

DIODE

D770	8-719-991-33	DIODE 1SS133T-77
D771	8-719-991-33	DIODE 1SS133T-77
D772	8-719-991-33	DIODE 1SS133T-77
D773	8-719-991-33	DIODE 1SS133T-77
D777	8-719-109-72	DIODE RD3.9ESB2

JACK

J701 Δ	1-251-182-11	SOCKET, CRT
---------------	--------------	-------------

COIL

L702	1-408-419-00	INDUCTOR 68UH
------	--------------	---------------

TRANSISTOR

Q711	8-729-326-11	TRANSISTOR 2SC2611
Q731	8-729-326-11	TRANSISTOR 2SC2611
Q751	8-729-326-11	TRANSISTOR 2SC2611
Q770	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q771	8-729-200-17	TRANSISTOR 2SA1091-O
Q772	8-729-200-17	TRANSISTOR 2SA1091-O
Q773	8-729-200-17	TRANSISTOR 2SA1091-O

RESISTOR

R700	1-260-087-11	CARBON	100	5%	1/2W
R703	1-260-105-11	CARBON	3.3K	5%	1/2W
R710	1-260-099-11	CARBON	1K	5%	1/2W
R712	1-215-924-00	METAL OXIDE	15K	5%	3W F
R716	1-249-411-11	CARBON	330	5%	1/4W



Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REF.NO.	PART NO.	DESCRIPTION	REMARK
R717	1-216-295-91	CONDUCTOR, CHIP (2012)	
R730	1-260-099-11	CARBON 1K	5% 1/2W
R732	1-215-924-00	METAL OXIDE 15K	5% 3W F
R736	1-249-411-11	CARBON 330	5% 1/4W
R737	1-216-295-91	CONDUCTOR, CHIP (2012)	
R750	1-260-099-11	CARBON 1K	5% 1/2W
R751	1-216-295-91	CONDUCTOR, CHIP (2012)	
R752	1-215-924-00	METAL OXIDE 15K	5% 3W F
R756	1-249-411-11	CARBON 330	5% 1/4W
R757	1-216-295-91	CONDUCTOR, CHIP (2012)	
R770	1-216-081-00	METAL GLAZE 22K	5% 1/10W
R771	1-216-049-91	METAL GLAZE 1K	5% 1/10W
R772	1-216-049-91	METAL GLAZE 1K	5% 1/10W
R773	1-216-049-91	METAL GLAZE 1K	5% 1/10W
R774	1-216-089-91	METAL GLAZE 47K	5% 1/10W
R775	1-216-049-91	METAL GLAZE 1K	5% 1/10W
R776	1-216-033-00	METAL GLAZE 220	5% 1/10W

MISCELLANEOUS

- 1-751-057-11 CORD, POWER (WITH CONNECTOR) 10A/125V
(KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)
- 1-769-796-31 CORD, POWER (WITH CONNECTOR) 10A/250V
(KV-21R22C/21RS22C/21RS50C)
- 1-766-374-11 PLUG, F-PIN
- 1-409-707-31 COIL, DEMAGNETIZATION
(KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)
- 1-411-986-11 COIL, DEMAGNETIZATION
(KV-21R22C/21RS22C/21RS50C)
- 1-452-032-00 MAGNET, DISC
- 1-452-277-00 MAGNET, BMC
- 1-505-507-11 SPEAKER (9x5) (EXCEPT KV-21RS50/21RS50C)
- 1-505-404-11 SPEAKER (8CM) (KV-21RS50/21RS50C)
- 3-704-372-31 HOLDER, HV CABLE
- 4-054-282-01 BRACKET, MAIN (KV-21RS50/21RS50C)
- 4-374-745-31 CUSHION (A) (KV-21RS50/21RS50C)
- 7-685-648-79 SCREW +BVTP 3X12 TYPE2 IT-3
- 7-685-663-79 SCREW +BVTP 4X16 TYPE2 N-S
- Δ 8-451-440-11 DY Y21NXA(VTM)
- Δ 8-738-768-05 CRT 21NX (A51LDG50X)
(KV-21PM2/21PS2/21R22/21RD2/21RS50/21SD2)
- Δ 8-738-781-05 CRT 21NX (A51LDG50X)
(KV-21R22C/21RS22C/21RS50C)

REF.NO.	PART NO.	DESCRIPTION	REMARK
ACCESSORIES AND PACKING MATERIALS			
1-417-182-11	CONVERTER (EAC-25)		
1-501-730-41	ANTENNA, TELESCOPIC		
3-810-814-42	MANUAL, INSTRUCTION		
1-475-093-21	REMOTE COMMANDER (RM-Y145) (KV-21PS2/21RS22C/21RS50/21RS50C/21SD2)		
1-475-094-21	REMOTE COMMANDER (RM-Y146) (KV-21PM2/21R22/21R22C/21RD2)		
9-939-830-01	BATTERY COVER, REMOTE		
4-041-254-01	BAG, PROTECTION		
* 4-052-645-01	CUSHION (LOWER) (ASSY) (EXCEPT KV-21RS50/21RS50C)		
* 4-039-443-01	CUSHION (LOWER) (ASSY) (KV-21RS50/21RS50C)		
* 4-052-648-01	CUSHION (UPPER) (ASSY) (EXCEPT KV-21RS50/21RS50C)		
* 4-039-442-01	CUSHION (UPPER) (ASSY) (KV-21RS50/21RS50C)		
* 4-053-803-01	CARTON, INDIVIDUAL (KV-21PM2/21PS2)		
* 4-052-663-01	CARTON, INDIVIDUAL (KV-21R22/21R22C/21RS22C)		
* 4-053-800-01	CARTON, INDIVIDUAL (KV-21RD2/21SD2)		
* 4-059-725-01	CARTON, INDIVIDUAL (KV-21RS50/21RS50C)		
* 4-055-202-01	SHEET, CORRUGATED (EXCEPT KV-21RS50)		

9-965-828-01

Sony Corporation
Sony Technology Center
Product Quality Division
Service Promotion Department

English
97DJ74117-1
Printed in U.S.A.
© 1997.4